C1850-1
11/20/86

PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS NOVEMBER 1986

Tips About
Pack Expo '86

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Durkee Upgrades
Pouch Lines

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Spray Pumps

New Labels
Catch the Eye

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A CAHNERS PUBLICATION
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SQUEEZABLES SOAR 147% IN TWO YEARS
Sales total $362 million for first half of '86

Squeezable containers for food products are presenting some impressive sales numbers since their introduction in 1983. According to business analysts SAMI/Burke, New York City, which has been tracking numbers since mid-1984, sales of food products in squeezable containers have risen 147% from that time, from $146 million to $362 million.

New food product introductions in squeeze bottles also are on the rise. In the first half of 1986, 36 new items were introduced, compared to 26 during the same period in 1985, according to Marketing Intelligence Service, Napies, N.Y. According to M.I.S., Kraft alone introduced eight new items in squeeze bottles. One introduced last year, squeezable Miracle Whip salad dressing, won the gold award in the retail packages category of PACKAGING'S Decision-Maker awards program, (see PACKAGING, Sept. 1986, p. 36).

Apparently, distribution is one of the few hurdles in the path of squeezables. More than 93 per cent of consumers who tried ketchup in a squeeze bottle liked it, according to PACKAGING'S Consumer Survey, (see June 1986, p. 38). Answering the question, "If you have not purchased ketchup, mayonnaise or jelly in a plastic squeezer container, why?" the answer, "Haven't seen them," garnered the largest response at 28.6 per cent.

VENDING MACHINES SET RECORD FOR SHIPMENTS
Sales per machine up slightly also

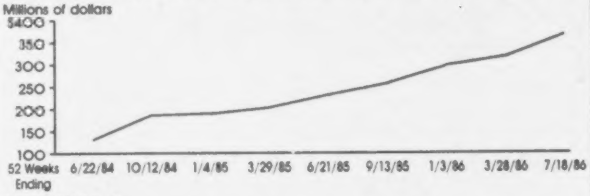
Packagers of products for the vending market may want to take note—factory shipments of new merchandise vending machines reached a record $428.5 million in 1985, up eight per cent from the $394.4 million reported for 1984.

Translated into number of machines, the 1985 total represents 561,117 vending machines, the fourth highest total in 18 years, according to the National Automatic Merchandising Association.

By category, food and confection machines led the way with a 15 per cent gain, followed by soft drinks at 11 per cent. Fresh-brew hot beverage machines and glassfront machines for snacks each increased 10 per cent. Those items sold from machines that reported above-average sales include bottled and canned drinks ($7,398), sandwiches, salads and entrees ($6,326).

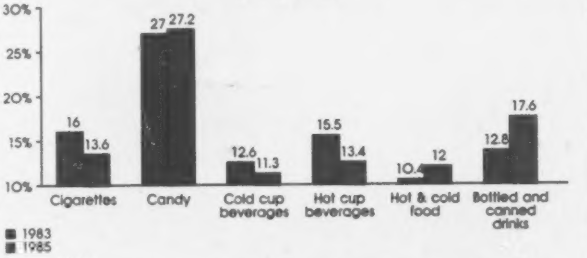
Average sales per machine in 1985 totaled $4,654, up slightly from 1984's figure of $4,271.

FOOD PRODUCTS IN SQUEEZABLE CONTAINERS



Source: SAMI/Burke
Since their introduction in 1983, food products in squeezable containers have continued to increase in sales, registering their sharpest rise so far this year.

RETAIL VENDING SALES BY PRODUCT CATEGORY 1983-1985



Source: NAMA
In two years, the fastest-growing product category for vending machine sales is bottled and canned drinks, which rose 4.8 percentage points.

CURRENT TRANSACTION PRICES FOR SELECTED PACKAGING MATERIALS
(All in $/lb.)

	Sept. 86	Aug. 86	Sept. 85
Aluminum can stock	1.06	1.03	.98
LDPE/liner	.24	.24	.29
LDPE/clarity	.27	.26	.36
LLDPE/butene	.24	.235	.27
LLDPE/octene	.29	.29	.35
HDPE/blow molding	.29	.29	.31
HDPE/film grade	.33	.33	.36
Polystyrene general purpose	.34	.33	.33
Polystyrene	.35	.34	.36
PVC general purpose	.29	.285	.27
PP/homopolymer	.33	.33	.345
PP/copolymer	.43	.43	.45
ABS	.98	.98	1.01
Unbleached kraft shipping sack	4.25	4.00	3.60
Unbleached kraft grocery sack	3.40	3.40	2.75
Linerboard, 42 lb. east	3.20	3.10	2.50
Linerboard, 42 lb. west	3.20	3.20	2.75
Corrugating, medium, semi-chemical	2.90	2.80	2.50
Recycled folding boxboard, clay coated	3.90	3.85	3.75
Recycled folding boxboard, chipboard	3.00	3.00	2.90
Bleached kraft board	6.00	6.00	5.70

Source: Purchasing, a Cahners Publication

PACKAGING LEADTIMES
(in weeks)

	Avg.	Month Ago	Year Ago
Metal cans	3.0	2.9	3.4
Composite cans	3.1	3.2	3.3
Glass containers	4.3	4.7	4.4
Plastic bottles	4.2	3.6	3.6
Plastic film	3.9	3.8	3.3
Laminates	6.0	5.4	5.0
Corrugated containers	3.1	3.1	2.8
Multiwall bags	4.5	3.5	3.2
Kraft Paper	3.2	3.1	2.8
Folding cartons	3.8	3.5	3.7
Fiber drums	3.2	3.1	3.2
Industrial crates	2.9	2.8	3.4
Strapping	2.7	2.6	2.5
Steel Drums (shipping)	2.8	3.1	2.9
Pallets	2.6	2.6	2.7

Source: Purchasing, a Cahners Publication

BEVERAGE MARKET TO REMAIN STRONG
Demographics and economics will keep market growing

Slow but steady growth is the watchword for the non-dairy beverage market through 1988. The market's value, which covers shipments of malt beverages, wines, brandies, distilled liquor, bottled and canned soft drinks, flavoring extracts and syrups, totaled $3.9 billion for July, up 6.6 per cent from the same time last year. Total market value in 1985 was $45.2 billion.

One reason for the healthy forecast is the attraction of packaged prepared beverages to the demographically strong baby boomer segment, according to Cahners Economics. As this segment continues to drink more bottled wine coolers and buy juice in aseptic packages for their children, the overall market is predicted to increase 6.5 per cent this year, 8.3 per cent in 1987 and 10.2 per cent in 1988.

MORE STATS . . .

Worldwide production of linear low-density polyethylene totaled 5.4 billion pounds in 1985 and will grow between 11 and 12 per cent annually through 1990, according to a new study by **SRI International**. Grocery sacks and pallet stretch wrap will be the fastest-growing markets for LLDPE in the United States over the next five years . . . Fruit and vegetable juices, with 1985 retail sales of $9.38 billion, will top $11 billion by 1990, according to **FIND/SVP**. One reason is the growing acceptance of aseptics. The study estimates that market share for aseptics will grow from 5 per cent in 1985 to more than 30 per cent by 1990 . . . Industry shipments of corrugated and solid fiber products increased 1.2 per cent in August compared to the same month last year, according to the **Fibre Box Association**. Year-to-date consumption is 5.4 per cent ahead of last year.

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THE CAHNERS MAGAZINE FOR DECISION-MAKERS/DECEMBER 1986

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30 Great Ideas In Packaging

New Way To Get Prototype Cartons

Big Gains For Stretch-Wrapping

Fiber Drum Holds Wine

How Upjohn Controls Packaging

Okidata Saves 40% With Molded PE

Mandarin Orange
Slice
10% fruit juice

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FOOD PACKAGING DEMAND TO HIT $63 BILLION

Aseptics will grow fastest; metal can will lead in sales

Between 1985 and 1990 the demand for packaging materials by food and beverage processors will grow from $29 billion to $43 billion, and by 1995 will exceed $63 billion.

According to "Processed Foods Packaging," published in September by FIND/SVP, New York City, the average annual growth of about eight per cent is based on both expanded packaging applications and industry consolidation.

The money leader in 1995 is predicted to be the metal can at $22.5 billion. The fastest grower will be aseptic systems, predicted to rocket 935 per cent between 1985 and 1995, but will occupy a much smaller segment of the market at $300 million. Similar performance is predicted for the retort pouch, slated to grow 733 per cent to total $100 million.

For more information, contact FIND/SVP, 500 Fifth Ave., New York, N.Y. 10110.

SALES RISE FORESEEN FOR CORRUGATED BOXES

Industry to display stiff pressure to expand sales

Through 1995, dollar sales for the corrugated and paperboard container industry are projected to rise 5.3 per cent annually, reaching a total of $31 billion. By comparison, manufacturers' sales in 1985 were more than $19 billion, a 3.5 per cent increase over 1984.

According to a study by Business Trend Analysts, Commack, N.Y., the market for corrugated boxes will continue to be the stronghold of the industry, predicted to jump 5.5 per cent per year as opposed to folding and set-up paperboard boxes. They are expected to perform less well due to the growing use of plastics and other alternative packaging materials in the areas of food and beverages, cosmetics, confections and others.

While the general U.S. economy is slated to remain strong, mergers, acquisitions and plant modernizations in the boxboard industry all point to an industry determination to continue expanding sales, the study reports.

More information on "The Corrugated and Paperboard Container Industry: An Analysis of Current Markets and Prospects for Future Growth" is available from Business Trend Analysts, 2171 Jericho Turnpike, Commack, N.Y. 11725.

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	Oct. '86	Sept. '86	Oct. 85'
Aluminum can stock	1.08	1.06	.96
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LLDPE/octene	.30	.29	.36
HDPE/blow molding	.31	.29	.34
HDPE/film grade	.345	.33	.37
Polystyrene/genral purpose	.34	.34	.33
Polystyrene/impact	.35	.35	.36
PVC/general purpose	.29	.29	.28
PP/homopolymer	.345	.33	.35
PP/copolymer	.45	.43	.45
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Recycled folding boxboard, chipboard	3.10	3.00	2.90
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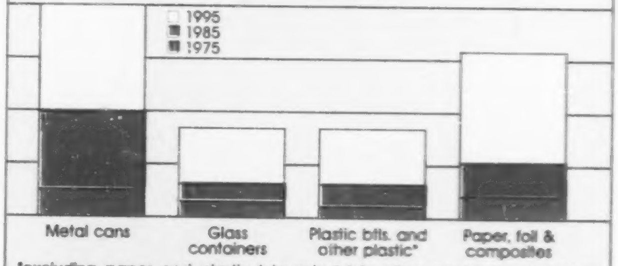
Source: Purchasing, a Cahners publication

FOOD PACKAGING DEMAND, 1975-1995 (in billions $)



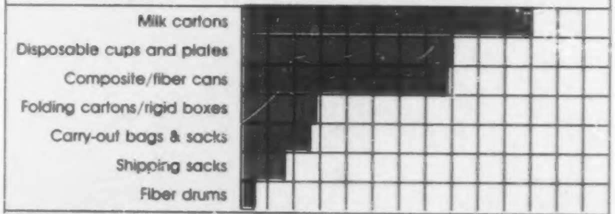
*excluding paper and plastic integrated into other packaging, including assepтics, retort pouches and dual-ovenable ware.
Source: FIND/SVP
Metal cans and glass containers together will account for more than half of all food packaging consumption.

MANUFACTURERS' SALES OF CORRUGATED AND PAPERBOARD PACKAGING (in billions $)

	1985	1986	1995
Folding paperboard	$4.65	$4.93	$7.58
Set-up paperboard	.64	.67	1.07
Corrugated & solid fiber	13.06	13.79	22.30
Total corrugated & solid fiber	13.06	13.79	22.30

Source: Business Trend Analysts Inc.
Corrugated and solid fiber boxes are predicted to remain an industry mainstay, marking $22 billion in sales in 1990.

PAPER'S LOSS OF POTENTIAL* TO PLASTIC, 1990 Lost potential as % of total potential



*projected tonnage as if paper's 1985 market position could be sustained through 1990. Does not include fiber boxes.
Source: Strategic Research Center
Inroads by plastics into traditional paper markets will be most keenly felt in milk cartons and composite cans.

PLASTICS TO GAIN ON PAPER, BOARD PRODUCTS

Will make 11% inroad on 1990 paper and board market

Excluding fiber boxes, if the 1985 market position for paper and paperboard packaging products and disposables could be maintained through 1990, approximately 11 per cent of it will be lost to plastic, translating into one million tons taken from a potential nine million-ton total.

According to Strategic Research Center, Cleveland, this loss of potential will be felt most in such end uses as milk cartons (45 per cent) and composite and fiber cans (30 per cent).

In comparison, the use of plastic resins in these categories is expected to increase 4.4 per cent annually, reaching a total of 6.9 billion pounds by 1990. The study predicts the fastest gains for plastics in the category of resins for pour-spout cans for automotive products, predicted to grow 20 per cent per year. The largest volume gains will be in the areas of food and non-food packaging films (440 million pounds) and carry-out bags (300 million pounds).

More information on "Market Update: An Analysis of the Plastic vs. Paper Battle" is available from Strategic Research Center, One Commerce Park Square, 23200 Chagrin Blvd., Cleveland, Ohio 44122.

MORE STATISTICS . . .

The demand for vinyl acetate monomer, a base material for packaging and labeling adhesives as well as ethylene vinyl alcohol (EVOH), will continue to grow through 1995, which may lead to tight supplies for an industry with no current projected capacity additions, according to a report from **U.S.I. Chemicals**, Cincinnati . . . New orders for packaging and packaging-related converting machinery were up 15.8 per cent in September compared to August, but down 3.0 per cent compared to September of last year, the **Packaging Machinery Manufacturers Institute** reported. The decrease compared to last year was due to a drop in foreign orders . . . The **Fibre Box Association** reports year-to-date industry shipments are 6.0 per cent higher than last year.

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PACKAGING

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New Packages Help Propel Turtle Wax To No. 1

How To Control Packaging Lines

New Thrust With Retortable Trays

Coated Plastics Double Shelf Life

Switching Labels Cuts Rejection Rate 90%

Pack Expo Unveils New Equipment

turtle wax
NEW!
100% Active Protectant
Clear Guard
Protects & Beautifies
Vinyl Rubber Leather
Lets The Natural Beauty Shine Through Instantly!
10 FL. OZ. (296 ml)

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PET FILM TO TOP 100 MILLION POUNDS

Forecast to 1990 see steady growth for packaging

U.S. consumption of PET film for merchant and captive packaging uses is forecast for steady if slow growth through 1990 with the market predicted to top 100 million pounds this year and more than 120 million pounds by 1990.

According to a study of U.S. PET film customers conducted by Eldib Engineering & Research, Berkeley Heights, N.J., 1985's level of consumption represented approximately $276.5 million, based on an average price of $3 per pound. 1990's projected level of 120.43 million pounds will mean an increase of $84.9 million in sales.

Flexible packaging is the third largest U.S. market for PET film, following graphic arts and magnetic recording, according to the study. Additionally, companies that make PET film for packaging are moving into more advanced applications, such as flexible printed circuits, the report stated.

Further information on the study is available from Eldib Engineering & Research Inc., 613 Springfield Ave., Berkeley Heights, N.J. 07922.

FOOD IN METAL CANS: SOME UP, SOME DOWN

Dairy and seafood rise; others decline slightly

While metal can shipments for beverages posted 1985 gains of 3.7 per cent and 10.5 per cent respectively for beer and soft drinks, food products in metal cans presented a more mixed view.

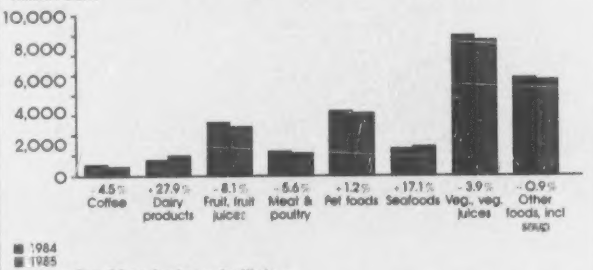
Food products in metal cans registered a 0.9 per cent decline in 1985 compared to a year earlier, according to the Can Manufacturers Institute (CMI). In terms of shipments, 27.87 billion food cans were shipped in 1985 compared to 28.11 billion the year before.

By category, however, dairy products gained 27.9 per cent and seafoods 17.1 per cent during the same time. The sharpest declines among broad-based foods were registered by fruit and fruit juices (−8.1%), meat and poultry products (−5.6%) and coffee (−4.5%).

Overall, the 34.6 billion steel cans shipped during 1985 represented a slight decline of 0.2 per cent from 1984. By contrast, aluminum can shipments reached 67.3 billion, a 6.7 per cent increase over the previous year.

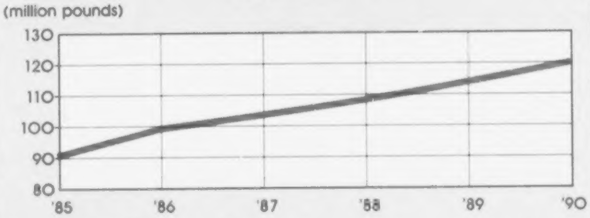
For more information on *Can Shipments Report 1985*, contact CMI, 1625 Massachusetts Ave., N.W., Washington, D.C. 20036

METAL CAN SHIPMENTS FOR FOOD PRODUCTS 1984-1985



Source: Can Manufacturers Institute
While metal can shipments registered slight declines in most food categories, dairy products rose 27.9% in 1985.

U.S. PET FILM FORECAST FOR PACKAGING USE 1985-1990



Source: Eldib Engineering & Research Inc.
While the packaging market for PET film has been called mature, steady growth remains the forecast.

PACKAGING LEADTIMES (in weeks)

	Avg.	Nov. '86	Nov. '85
Metal cans	2.9	3.0	3.3
Composite cans	3.3	3.6	3.4
Plastic bottles	3.7	3.7	3.2
Plastic film	4.3	6.1	4.8
Laminates	4.3	6.1	4.8
Corrugated containers	2.8	3.1	2.9
Multiwall bags	3.4	4.0	2.8
Kraft paper	3.2	2.8	2.7
Folding cartons	3.9	4.0	3.1
Fiber drums	2.9	3.2	3.1
Industrial crates	2.9	2.8	3.3
Strapping	2.6	2.8	2.7
Steel drums (shipping)	2.7	2.8	2.9
Pallets	2.5	2.7	2.7

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES ($/lb.)

	Avg.	Nov. '86	Nov. '85
Aluminum can stock	1.07	1.08	.96
LDPE/liner	.27	.25	.30
LDPE/clarity	.31	.265	.36
LLDPE/butene	.27	.245	.30
LLDPE/octene	.34	.30	.35
HDPE/blow molding	.32	.31	.33
Polystyrene/general purpose	.34	.34	.32
Polystyrene/impact	.35	.335	.36
PVC/general purpose	.30	.285	.27
PP/homopolymer	.35	.345	.35
PP/copolymer	.45	.45	.45
ABS	.98	.98	1.01
Unbleached kraft/shipping sack	4.30	4.25	3.00
Unbleached kraft/grocery sack	3.75	3.60	2.75
Linerboard, 42 lb., east	3.20	3.20	2.50
Linerboard, 42 lb., west	3.20	3.20	2.75
Corrugated med., semichemical	2.90	2.90	2.40
Recycled folding boxboard, clay coated	3.90	3.90	3.75
Recycled folding boxbd., chipbd.	3.00	3.00	2.90
Bleached kraft, folding carton	6.10	6.10	5.45

Source: Purchasing, a Cahners publication

CAPACITY TO RISE FOR PAPER AND PAPERBOARD

Most of the gains will take place in 1987

The paper and paperboard industry will increase capacity by 4.2 million tons between 1986 and 1989, a gain of about 1.8 per cent annually, according to the results of the American Paper Institute's (API) annual capacity survey. According to Norma pace, API senior vice president, about 42 per cent of the new capacity will be added in 1987 with smaller annual additions planned for the following two years.

If plans proceed as indicated, U.S. capacity to produce paper and paperboard will be 79.8 million tons in 1989, compared to 75.6 million tons in 1986. Output for that year was an estimated 70.4 million tons.

According to the report, manufacturers of packaging papers continue to shut down or divert capacity to other grades. However, strong efforts by the industry to promote the paper bag have presently stabilized the market for kraft papers.

Continued expansion is the forecast for the fiber box market with unbleached kraft paperboard capacity predicted to rise 1.6 per cent a year through 1989.

Copies of the capacity survey are available from API by writing the Capacity Dept., Box SB, API, 260 Madison Ave., New York, N.Y. 10016. The report costs $275.

MORE STATS . . .

Continuing a two-month streak of record shipments, the **Fibre Box Association** reported October 1986 shipments of 27.132 billion square feet, five per cent higher than October 1985 and the highest month of shipments the industry has ever had. Containerboard consumption was 2,009,860 tons in October, 4.1 per cent higher than the previous year and also a new industry record. Inventory of containerboard at both box plants and mills as of Oct. 1 was 2.274 million tons.

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/FEBRUARY 1987

Blister Packs Reach New Heights

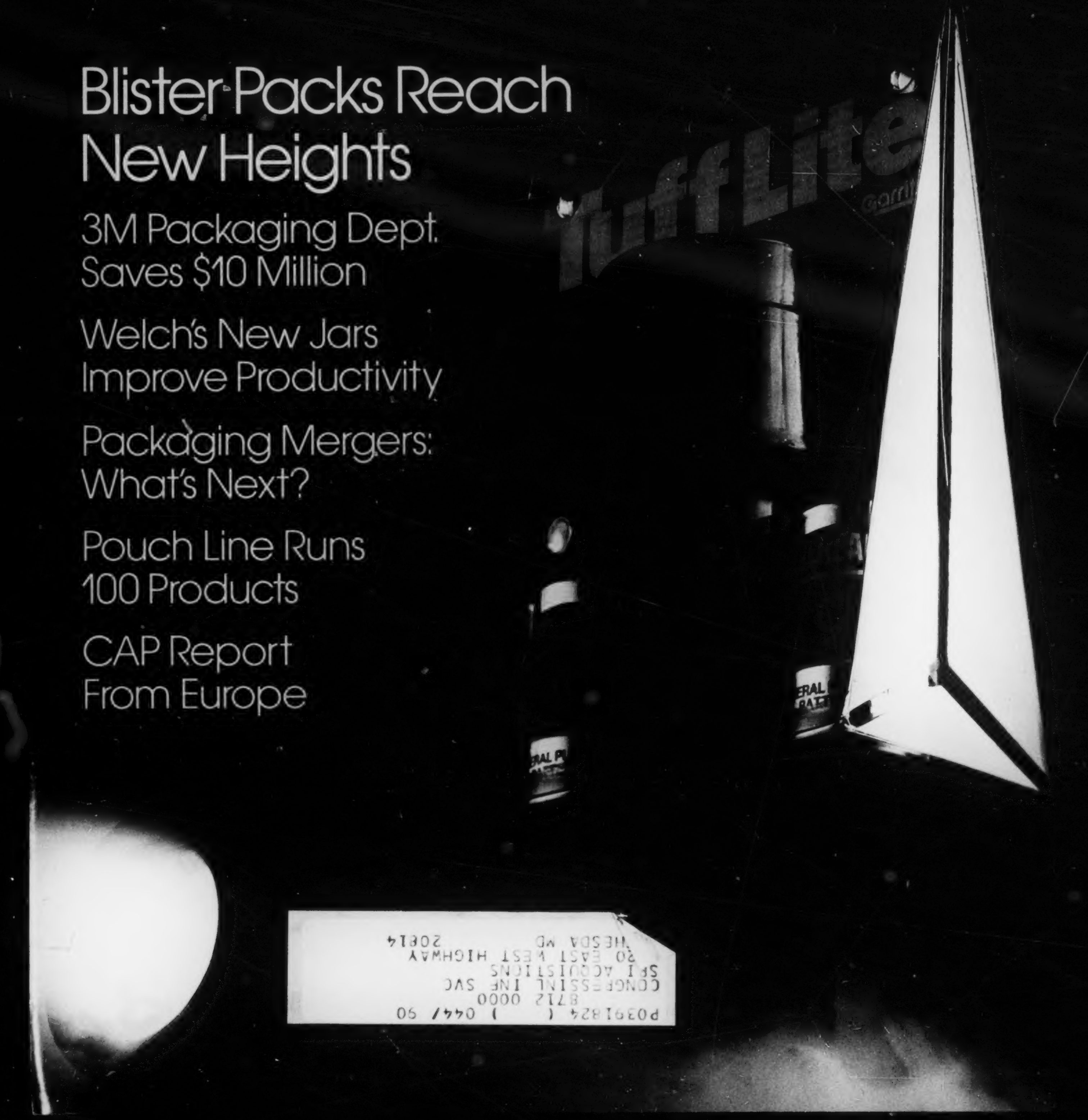
3M Packaging Dept. Saves $10 Million

Welch's New Jars Improve Productivity

Packaging Mergers: What's Next?

Pouch Line Runs 100 Products

CAP Report From Europe



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LEADING INDICATORS POINTING UP IN '88

Equipment spending expected to rise 9.3%

The U.S. economy will be stronger overall in 1987 and 1988 with the largest improvements, surprisingly, in such heavy industries as metals, metalworking and machinery manufacturing.

So says an economic report issued by Cahners Publishing Co., the publisher of PACKAGING and approximately 50 other business magazines.

Industrial machinery makers will be among the main beneficiaries of the weaker dollar as the penetration of U.S. markets by foreign manufacturers slows and foreign purchases of U.S. products pick up. Equipment spending is tagged at a modest 0.3 per cent increase for 1987 but that is predicted to change to a 9.3 per cent gain in 1988.

Production of consumer packaged goods has continued to increase even as other sectors of industrial production have declined. The Consumer Packaged Goods Index, which covers production of such items as food and tobacco, consumer chemicals, consumer paper products and miscellaneous home goods, among others, is predicted to finish 1986 at 4 per cent higher than 1985. The index is forecast to rise 3.2 per cent in 1987 and 7.7 per cent in 1988.

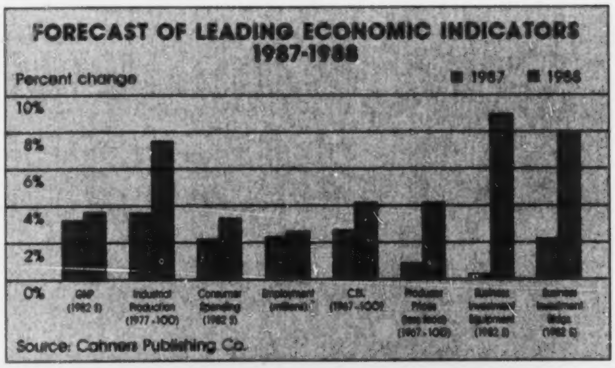
CORRUGATED SALES AND SQUARE FOOTAGE RISE

Independent converters report 9.3% sales increase

Results from the third-quarter 1986 business comparison survey conducted by the Association of Independent Corrugated Converters (AICC) show the independents reporting an average increase of 10.3% in corrugated square footage and 9.3% in sales dollars over the same period in 1985.

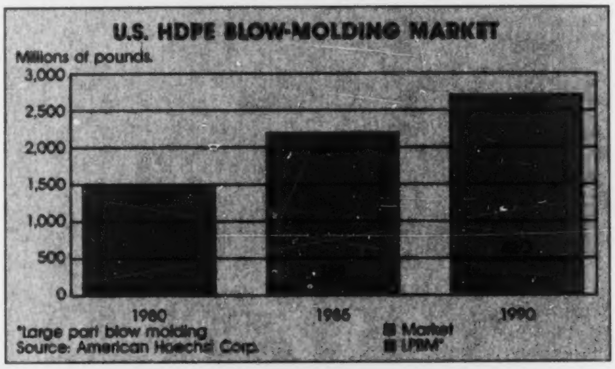
More than 200 AICC member companies responded to the association's first survey covering the first half of 1986, which reported gains of 5.9% in shipments and 2.6% in sales. The business comparison survey was started in 1986 in response to conflicting reports received by the association on business conditions throughout the United States and Canada. AICC intends to conduct the survey four times a year from its headquarters in Alexandria, Va.

FORECAST OF LEADING ECONOMIC INDICATORS 1987-1988



Source: Cahners Publishing Co.

U.S. HDPE BLOW-MOLDING MARKET



*Large part blow molding
Source: American Hoechst Corp.

PACKAGING LEADTIMES (in weeks)

	Dec. '86	Nov. '86	Dec. '85
Metal cans	3.4	2.9	4.1
Composite cans	3.2	3.3	4.2
Glass containers	4.3	5.0	4.9
Plastic bottles	3.9	3.7	3.9
Plastic film	3.5	3.6	4.3
Laminates	5.4	4.3	4.7
Corrugated containers	2.9	2.8	2.9
Multiwall bags	3.7	3.4	3.3
Kraft paper	3.0	3.2	3.1
Folding cartons	4.0	3.9	3.9
Fiber drums	3.5	2.9	3.1
Industrial crates	3.3	2.9	4.2
Strapping	2.7	2.6	2.9
Steel drums (shipping)	2.8	2.7	3.1
Pallets	2.7	2.5	2.8

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES ($/lb.)

	Dec. '85	Nov. '86	Dec. '86
Aluminum can stock	1.06	1.08	.96
LDPE/liner	.29	.27	.31
LDPE/clarity	.33	.31	.36
LLDPE/butene	.27	.27	.30
LLDPE/octene	.35	.34	.35
HDPE/blow molding	.33	.32	.33
HDPE/film grade	.35	.36	.36
Polystyrene/general purpose	.34	.34	.33
Polystyrene/impact	.35	.36	.36
PVC/general purpose	.31	.30	.27
PP/homopolymer	.35	.35	.35
PP/copolymer	.48	.48	.46
ABS	.98	.98	1.01

BLOW-MOLDING MARKET TO GROW 5% FOR HDPE

By application, trend favors larger components

The blow-molding market, the largest for all U.S. sales of high-density polyethylene (HDPE), is expected to continue growing through 1990 but at a slower rate than between 1980 and 1985.

American Hoechst's HDPE business unit located in Houston reports that the average growth rate for the U.S. HDPE blow-molding market rose 8 per cent from 1980 to 1985 or from 1.5 billion to 2.2 billion pounds. A 5% increase is predicted for the period through 1990.

By product application, blow-molding of large components such as closed-head drums, 90-gallon municipal refuse containers and automotive gas tanks will grow 20% from now through 1990. Though a sizable increase, the same product category grew 40% between 1980 and 1985, Hoechst reported.

At press time, Hoechst estimates a 1986 year-end production total of 7.025 billion pounds in 1986, a 6.4% increase over 1985. Total HDPE capacity in place is 7.5 billion pounds so the company is predicting very tight supplies of HDPE through 1987 and 1988.

MORE STATS . . .

The Paper & Packaging Bulletin, a research publication of London-based *The Economist* magazine reports that UK output of plastic thin-wall containers for food products has risen an average of 5% annually between 1980 and 1985 to a total of 2.7 billion units. The bulletin cites yogurt as the dominant market for these containers, claiming 1.1 billion of the 1985 container figure. Published quarterly, annual subscriptions for the bulletin cost $340 (U.S.) and are available from The Economist Publications Ltd., 40 Duke St., London W1A 1DW, England . . . The 24th edition of *The Statistics of Paper, Paperboard and Wood Pulp* has been published by the **American Paper Institute**. The report covers significant statistical areas such as production, sales, regional data, capital expenditures and others. Reports cost $250 each ($275 for overseas delivery) and are available by writing Economics Dept., SBD, American Paper Institute, 260 Madison Ave., New York, N.Y. 10016.

PACKAGING SUPPLIERS BRACE FOR NEW DEALS

Mergers and acquisitions in the packaging industry have made headlines in the past year, and involve some venerable supplier names. What will it mean for the packager?

By Melissa Larson
Senior Editor

Some of the oldest names in packaging are merging, spinning off businesses, being snapped up by foreign-owned conglomerates, and generally becoming fewer—and larger. Call it "restructuring" or "consolidation," but it seems to be happening with increasing frequency, especially in the past year.

What will it all mean for packagers, as the new facts of American business change their old supplier networks forever?

PACKAGING magazine spoke with a wide spectrum of industry spokesmen, encompassing packagers, suppliers, consultants and analysts. Although each restructuring needs to be judged according to its own merits, some of the recent transactions have created a climate of anxiety.

Many of those we spoke with are concerned about a possible deterioration in packaging R&D, testing and other supplier services formerly taken for granted.

Many others voiced the concern that as U.S. packaging managers are busily doing deals and watching stock prices, European, Japanese and even South American packaging suppliers are coming up with the innovations and grabbing business.

However, still others envision another result of the "new deals"—closer R&D partnership between packagers and their suppliers, with focused, well-planned research producing the packaging breakthroughs of the future.

Packaging business today

The business of packaging has radically changed in the past ten years—that much is obvious to anyone closely involved with the field. Some of the changes have to do with the general climate of American business—what the experts call "restructuring" or "consolidation."

But other changes have quietly been taking shape for decades. Although the pace has accelerated lately, foreign competition, foreign ownership, and the gradual shift from technology-driven to market-driven product development have long been a fact of life for both packaging suppliers and end users in what most agree is a maturing industry.

As recently as 25 or 30 years ago, a handful of packaging supplier firms did the bulk of the important packaging development. They provided their customers and potential customers with the technology, machinery, materials, and support personnel to package their products in a variety of new ways.

These firms had committed themselves to remaining in the packaging business, and they were able, willing and prepared to carry the necessary long-term financial burden.

But there was a down-side, too. As a marketer for a large packaging supplier recently commented, "In the old days, we came up with a new material and in essence told our customers, 'O.K., here's the new product, this is what you'll use it for, and here's how much you'll pay for it.' We were pretty arrogant."

Today, bottom-line oriented American managements of very large companies can no longer afford to carry forward such expensive R&D efforts—beyond one or two quarters. Any new product development must offer a swift payback.

To make a profit, packaging suppliers must make more of an effort to develop what their customers want. It sounds simple, but some packagers wonder if the restructured companies will be

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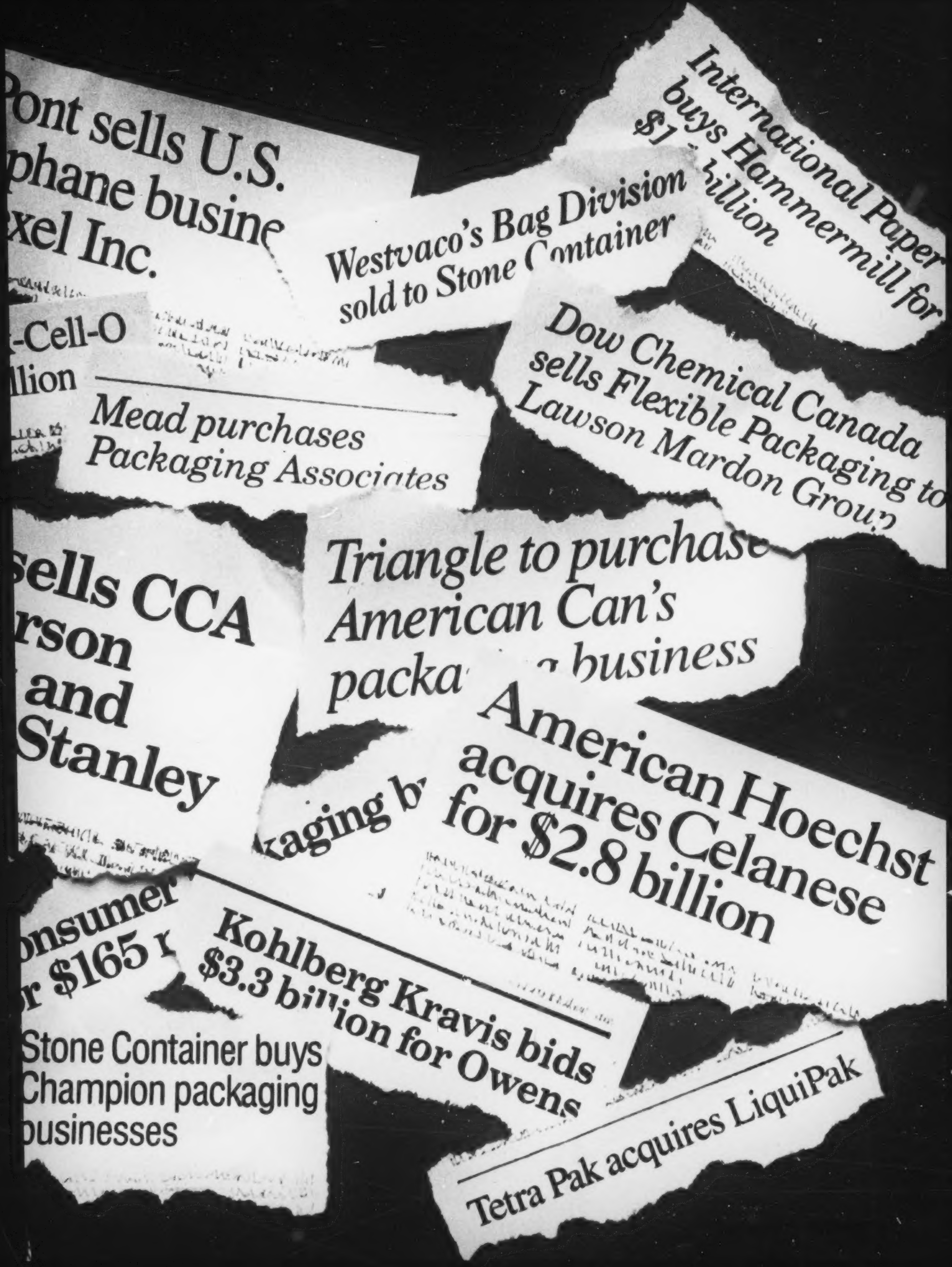
Textron to buy
Corp. for $1.05
Mobi
to Jef
Smurf
Morga
Boise sells
to Sonoco



Pont sells U.S.
phane busine
xel Inc.

International Paper
buys Hammermill for
$1 billion

Westvaco's Bag Division
sold to Stone Container

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Mead purchases
Packaging Associates

Dow Chemical Canada
sells Flexible Packaging to
Lawson Mardon Grou

sells CCA
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and
Stanley

Triangle to purchase
American Can's
packa business

kaging b

American Hoechst
acquires Celanese
for $2.8 billion

onsumer
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Kohlberg Kravis bids
$3.3 billion for Owens

Stone Container buys
Champion packaging
businesses

Tetra Pak acquires LiquiPak

Laden with debt, restructured firms can be in a state of confusion for months

able to pull it off.

The very pioneers who led the R&D effort for years are appearing in the Wall Street headlines. American Can and National Can have become part of Triangle Industries—now one of the nation's largest packaging suppliers. Continental Can has "gone private," in financial parlance. Container Corp. of America is now jointly owned by Jefferson Smurfit Corp. and The Morgan Stanley Leveraged Equity Fund.

Other old packaging names have made news by buying and selling particular businesses to each other, as they try to carve out niches of expertise for themselves, and get rid of unprofitable product lines. Several paperboard companies, including Westvaco, International Paper, Stone Container and Champion International have been involved in this type of transaction.

Some giant petrochemical companies, living in the post-OPEC reality of lower profits, are spinning off the plastic resin operations purchased with those oil dollars. Many plastics have become commodities, and the low margins earned leave little to invest in container R&D.

One major concern for packagers is that, after such transactions, the restructured companies usually need to "put their houses in order." Sometimes laden with debt and carrying personnel from two or more firms, management can be in a state of confusion for weeks or months.

"The down-side of many of these transactions is that some of the companies are so highly leveraged that they can't take advantage of opportunities," explained Al Austin, vice president of containers and capital improvements at Campbell Soup Co. "Existing R&D strategies are thrown into a turmoil, and there is no consideration for the needs of the customer."

Foreign influence

Into the void, some say, rush foreign packaging machinery, materials and techniques. Overseas marketers cruise U.S. shows, looking for niches, unmet needs. They often don't have as much overhead or middle management, so they make a profit more easily. Before long, Americans are going to overseas shows to learn what's new.

"Today's packaging technology is coming from Europe, when it has to do with food or concepts, and from Japan when it comes to manufacturing techniques," said Austin. "I was in Japan last month, and I can assure you that they are quite aggressive in their pursuit of U.S. packaging dollars."

Stan Sacharow, executive director of The Packaging Group Inc., would add South America to the list. "We're seeing a great deal of South American printed goods—polyethylene bags from Brazil, and OPP and cellophane from Mexico, among others."

Part of this influx of foreign technology and goods has to do with sheer aggressiveness, according to Dr. Aaron Brody of Schotland Business Research, who was interviewed during Pack Expo week.

"When you visit an American show such as this one, you're struck by the numbers of Europeans cruising the aisles—and I mean management people, presidents of very large foreign packaging firms. They're on the lookout for new business," he stated. "At a European packaging show, you don't see American packaging management people at all. Why not? Because they're at home reading The Wall Street Journal."

But Brody also points out that some small American firms, not part of the Wall Street frenzy, are coming up with innovative new products.

"Technology is coming from the smaller companies. They don't have the resources to do it all, so they focus on a single concept or technology and really work on it."

Cautious optimism

The acquisition of American Can by Triangle Industries has attracted more attention than most of the recent deals, mainly because of American Can's reputation for packaging innovation.

From pioneering the U.S. canning industry to recent barrier container innovations like the Gamma bottle and the Omni can, the firm's R&D is respected worldwide. Many

CONTAINER INDUSTRY—CURRENT EARNINGS ESTIMATES

Company	Symbol	Price 12/26/86	52-Week Price Range	Current Dividend	Yield	1985 Book Value	Earnings Per Share			P/E Ratios			5-Yr Growth	
							1985A	1986E	1987E	1985A	1986E	1987E	EPS	DIV
American Can	AC	$84.88	$91.88 - 58.75	$2.90	3.42%	$47.16	$5.06	$5.50	$7.00	16.77	15.43	12.13	15.0	0.0
Anchor Hocking	ARH	29.75	35.00 - 23.25	1.48	4.97	24.21	0.23	0.75	1.50	NM	39.67	19.83	10.0	6.0
Ball Corp.	BLL	36.50	45.50 - 26.25	0.82	2.25	14.38	2.24	2.50	2.85	16.29	14.60	12.81	13.5	10.0
Brockway	BRK	24.13	29.88 - 17.63	0.88	3.65	18.17	1.46	2.35	2.65	16.52	10.27	9.10	13.0	10.0
Crown Cork & Seal	CCK	105.50	114.25 - 77.25	—-	—-	50.46	6.52	7.50	8.50	16.18	14.07	12.41	13.5	0.0
Diamond-Bathurst	DBH	11.38	35.13 - 10.50	0.20	1.76	10.46	1.94	-0.30	2.00	5.86	NM	5.69	20.0	10.0
Dorsey Corp.	DSY	21.88	28.50 - 18.00	0.64	2.93	12.10	1.60	1.75	1.90	13.67	12.50	11.51	10.0	10.0
Heekin Can	HEKN	18.50	26.75 - 17.00	—-	—-	8.02	2.28	2.35	2.85	8.11	7.87	6.49	11.0	0.0
Owens-Illinois (D)	OI	52.13	52.25 - 25.75	0.95	1.82	25.76	2.55	2.90	3.50	20.48	17.97	14.89	12.0	7.0
Sealed Air	SEE	41.75	43.75 - 33.13	0.48	1.15	12.92	1.95	2.15	2.40	21.41	19.42	17.40	16.9	10.0
Triangle Industries	TRI	27.13	31.75 - 16.00	0.12	0.44	11.16	2.66	0.62	3.00	10.20	43.75	9.04	16.0	0.0

A: Actual D: Fully Diluted E: Estimated NM: Not Meaningful EPS: Earnings Per Share DIV: Dividend
Source: The First Boston Corp.

have wondered how the acquisition will effect that R&D effort.

But American Can personnel, both on and off the record, seem upbeat and encouraged by Triangle's treatment of previously acquired National Can.

"In the first 18 months they owned National Can, Triangle Industries doubled National's capital budget," explained Norm Wholley, American Can's vice president of corporate markets. "That gave us confidence that Triangle is in fact committed to long-term growth in the packaging industry. They've agreed to spend hundreds of millions on machinery, and they're building new plants."

"Triangle management seems to realize that a firm doesn't achieve long-term growth without strong R&D," he continued. "We believe that our position in barrier plastics and other high-investment development will continue."

More new deals

The merger and acquisition trend among packaging suppliers shows no sign of slowing down. As this article went to press, Owens-Illinois Inc. announced that leveraged buyout specialist Kohlberg Kravis Roberts and Co. had made a formal proposal to acquire the glassmaker for $3.3 billion. Owens spokesman Jerry Arkebauer said that the board of directors was considering the proposal but that "no timetable has been set for reaching a decision."

Monsanto Co. has announced that it is negotiating with Ball Corp. for the sale of the assets associated with Monsanto's plastic container business. Observers regard this transaction as good news for packagers, because Ball's commitment to R&D should enable them to make better use of Monsanto's plastic container technology, which some felt was getting lost in the shuffle at the chemical giant.

Next, Sonoco Products Co. announced that it had agreed with Boise Cascade to purchase Boise's consumer packaging business, the assets of which include 27 plants making composite cans and/or plastic bottles. The deal should be concluded by the end of the first quarter of 1987, according to Sonoco spokesman Dick Puffer.

Apparently, packagers and suppliers alike will have to continue to adjust to the new order. A new cooperation will be necessary. With that cooperation may come a more direct relationship between new packages in the laboratory, and the packages the consumer wants to find on supermarket shelves. ■

MELISSA LARSON
Senior Editor

An avid reader of general business publications, Melissa Larson is finding that the "business" of packaging is becoming almost as interesting as packaging itself.

CONTAINER STOCK ANALYST SAYS MERGERS CAN BENEFIT FIRM

Cornelius W. Thornton makes a living analyzing packaging stocks for clients of The First Boston Corp., a major New York-based investment banking firm.

And he's very good at it. Thornton, called "Perk" by his friends and associates, was recently named to the "All-America Research Team" by *Institutional Investor* magazine, which ranks top analysts in several industry areas of expertise.

In the "Containers" category, Thornton has received "1st team" honors, as top analyst, two years in a row. PACKAGING magazine felt his extensive knowledge of the industry from an investment standpoint would enable Thornton to provide an interesting view of recent packaging company transactions.

What follows is a distillation of his recent written analyses of the packaging industry for investors, as well as a PACKAGING interview at First Boston's New York headquarters.

On the industry as a whole:

"In our opinion, packaging is experiencing what we would describe as a mini-boom. Better underlying fundamentals, including substantially higher operating rates, firmer prices, and stable to declining costs are not only widening margins but are also boosting profits. The emerging evidence suggests that the improvements will continue for the next several years, if not longer.

"While plastic continues to make substantial inroads in the packaging market, and will emerge as the packaging material of the future, it is presently plagued by narrow margins and low levels of profits.

"On balance, though, we not only look for a continuing role for metal cans and glass containers, but also see a growing niche for plastic."

On metal and glass container stock performance:

"For the past few years the group has performed outstandingly, almost doubling in value. We attribute most of the gain in the group to a rising stock market in general, restructuring at several companies in the industry, and takeovers, as four and sometimes six companies have been directly or indirectly targets of takeover activity.

"By and large, we believe the increased valuation reflects a growing realization that the container industry is in a state of improved health . . . Investors are rapidly altering their opinion toward the metal and glass container industry."

On mergers in general:

"When large firms merge, they don't always need all accounting, purchasing, sales, or independent R&D functions from both firms. Contrary to conventional wisdom, there *can* be economies of scale."

On the acquisition of American Can by Triangle Industries:

"In my opinion, the acquisition by Triangle of American Can's packaging business will not diminish the R&D effort of the business. Triangle was already involved in packaging, and obviously saw American Can's expertise in plastics packaging, for instance, as a growth opportunity.

"Triangle management now feels, justifiably, that they're No. 1 in packaging development, with the recent acquisition. They've demonstrated their commitment to packaging by building plants and buying machinery. The plant being built in Illinois for the Omni container is an example of that commitment.

"In short, I just don't feel that Triangle bought American Can with the intention of dismantling the firm's well-established business."

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3/31/87

PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/MARCH 1987

Cosmetic Packages 'Sizzle'

IBM Saves $1 Million With Just-In-Time

Interpack '87 Bigger Than Ever

New Ideas For Coding And Marking

Mary Kay Installs New Packaging Line

'Zipper' Reseals Cheese Packages

Bell & Howell Solves Labeling Problem

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FORECAST MIXED FOR FOOD CONTAINERS

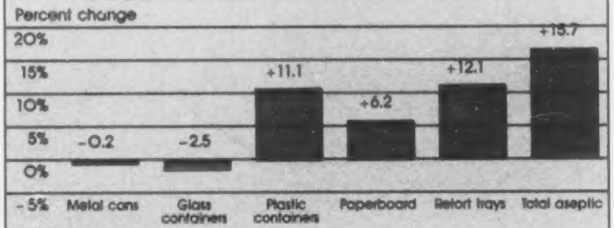
Outlook shows growth in plastics

The overall food packaging market will grow from 172 billion units in 1986 to approximately 191 billion units in 1996, according to a recently published study by Business Communications Co. Inc., Norwalk, Conn.

Not all containers will grow equally, though. "Plastic containers will grow by 11 per cent as metal and glass decline," said senior analyst Larry Wang. Not even all plastic containers will grow equally either, he continued. "The fastest-growing segments of plastics food packaging will be co-extruded, high-barrier multilayer bottles, jars and cans, and thermoplastic, dual-ovenable entree trays, mostly manufactured from crystallized PET. Retort trays are expected to grow by about 12 per cent per year."

The study estimates that metal cans for foods and beverages will decline slightly over the next 10 years from roughly 95 billion units to 93 billion. The fastest growth rate is forecast for aseptic packages, slated to grow nearly 16 per cent, though the volume is much smaller, from 4.9 billion units in 1986 to 12.6 billion in 1996.

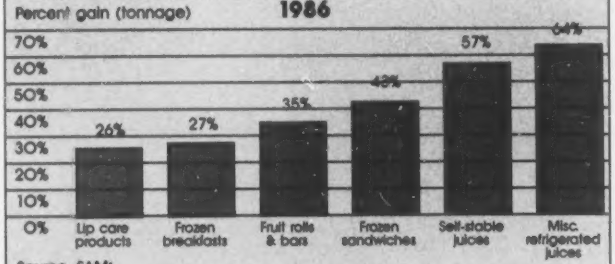
FOOD CONTAINER GROWTH 1986-1996



Source: Business Communications Co. Inc.

While volumes vary, plastic and paperboard food containers are predicted to grow at the expense of metal and glass.

FASTEST-GROWING PACKAGED FOODSTORE ITEMS: 1986



Source: SAMI

Products and packages emphasizing health, convenience and quality show the most growth in the flat food-store market.

PACKAGING LEADTIMES (in weeks)

	Jan. '87	Dec. '86	Jan. '86
Metal cans	3.7	3.4	3.7
Composite cans	3.3	3.2	4.2
Glass containers	4.7	4.3	5.7
Plastic bottles	3.2	3.9	4.1
Plastic film	3.5	3.5	3.9
Laminates	5.3	5.4	4.9
Corrugated containers	2.9	2.9	3.1
Multiwall bags	4.3	3.7	3.8
Kraft paper	3.2	3.0	2.8
Folding cartons	3.9	4.0	3.6
Fiber drums	2.9	3.5	3.5
Industrial crates	2.8	3.3	3.2
Strapping	2.7	2.7	2.8
Steel drums (shipping)	3.5	2.8	3.2
Pallets	2.5	2.7	2.7

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES

	Jan. '87	Dec. '86	Jan. '86
Aluminum can stock ($/lb.)	1.07	1.07	.96
LDPE/liner($/lb.)	.28	.29	.33
LDPE/clarity($/lb.)	.32	.33	.38
LLDPE/butene($/lb.)	.28	.27	.32
LLDPE/octene($/lb.)	.32	.35	.37
HDPE/blow molding($/lb.)	.34	.33	.35
HDPE/film grade($/lb.)	.35	.35	.38
Polystyrene/general purpose($/lb.)	.36	.34	.34
Polystyrene/impact($/lb.)	.37	.35	.38
PVC/general purpose($/lb.)	.31	.30	.29
PP/homopolymer($/lb.)	.36	.35	.37
PP/copolymer($/lb.)	.46	.45	.47
ABS($/lb.)	.98	.98	1.01
Unbleached kraft/shipping sack($/ton)	430	430	375
Unbleached kraft/grocery sack($/ton)	375	375	275
Linerboard, 42 lb. east($/ton)	350	320	250
Linerboard, 42 lb., west($/ton)	360	320	260
Corrugated med., semichemical($/ton)	320	290	235
Recycled folding boxboard, clay coated($/ton)	400	390	375
Recycled folding boxbd., chipbd.($/ton)	320	300	290
Bleached kraft, folding carton($/ton)	610	610	545

Source: Purchasing, a Cahners publication

PACKAGING KEY TO HIGH-GROWTH PRODUCTS

Convenience, health and quality are the new buzzwords

Although the prediction for food sales remains slow to flat, those packaged-food categories that showed a tonnage gain of 25 per cent or more last year emphasized what one analyst calls the new marketing buzzwords for the mid-1980s: convenience, health and quality.

According to Alan Miller, vice president of Sales Areas-Marketing Inc. (SAMI), New York, convenience translates into such package-related concepts as microwavable, disposable, squeezable, portion-pack and time-saving. Health is connected to reduced sugar or sodium, low calories, cholesterol or fat and high fiber. Quality means premium pricing with gourmet attributes.

Correspondingly, those packaged food store categories that showed the biggest tonnage gains in 1986 include refrigerated juices at 64 per cent, shelf-stable juices and juice concentrates at 57 per cent and frozen sandwich items at 43 per cent.

According to Miller, convenient portion-pack aseptic products helped drive the growth in juices in addition to the sales vitality of the Gatorade brand, which falls under the health banner. Frozen foods are under the convenience banner to start out with, he added.

HIGH-TECH PRODUCTS TO LEAD 1987 ECONOMY

Synthetics, will grow fastest

Companies that produce high-tech products will continue to lead the economy in 1987, according to Cahners Publishing Co., publishers of PACKAGING.

"The best-performing high-tech industries in 1987 will be synthetic materials, such as plastic resins, synthetic rubber and textile fibers, and pharmaceuticals, which are reaping the benefit of large outlays for research and development that have been made in the past several years," said James W. Haughey, director of Cahners Economics. "Other high-tech products, such as electronics components and computers also will do better in 1987."

The company estimates that production of high-tech products will grow 7.7 per cent in 1987, compared to 1986's growth rate of 8.7 per cent. Traditional or basic industries such as metals, coal mining, petrochemicals and manufacturing, will grow only about 1 per cent in 1987 after a decline of 3.1 per cent in 1986.

MORE STATS . . .

The monthly trend report for the **Package Machinery Manufacturers Institute** shows that new orders for packaging and packaging-related converting machinery for November were down 12.8 per cent from October but up 6.2 per cent from November of 1985. The increase in total orders from 1985's level was due entirely to an increase in foreign orders. Total orders for 1986 to date are running 2.3 per cent ahead of 1985 . . . Despite a market presence of more than 20 years, the **Dow Chemical Co.** is predicting that the plastic loose-fill packaging material business will continue to grow between 10 and 15 per cent annually. The company cites the growing mail-order industry as largely responsible.

PACKAGING ENCYCLOPEDIA

1987

- Contains Over 100 Technical Articles
- The Year's Best Packages
- New Technical Developments
- Outlook For Materials
- Free Literature
- Index To Packaging Articles

PACKAGING ENCYCLOPEDIA

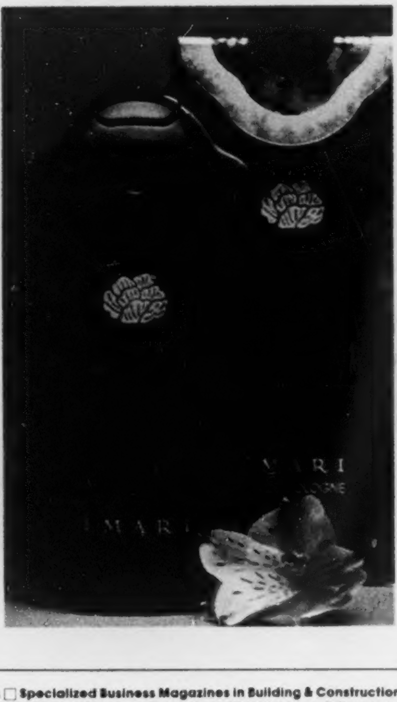
The 1987 Packaging Encyclopedia is designed to provide ready access to a wide range of information on packaging.

In addition to about 100 technical articles on packaging materials, methods and equipment, there is a look at the past year's most exciting packages and technological developments and a look at what's ahead for various container categories.

The basic reference articles are divided into four separate sections: Materials, Containers & Components, Industrial & Shipping Supplies and Machinery. Within each of these groupings, subjects are arranged alphabetically.

In addition, there is a Reference Guide that contains material on testing of packages, containers and packaging materials and the legal aspects of packaging. There are also two special product literature sections.

The book serves a dual purpose. It is an indispensable reference source for packaging professionals. It also serves as a comprehensive training tool for those preparing to take on packaging responsibilities.



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THE OUTLOOK FOR RIGID CONTAINERS

In 1986 rigid containers—glass containers, metal cans and plastic bottles—continued in the modest growth pattern that has prevailed since 1982. Indications are that this trend will continue.

There was growth in all three categories. In one case, glass containers, growth ran counter to an early-1986 projection: In the 1986 edition of the U.S. Department of Commerce's annual U.S. Industrial Outlook, Richard Blassey, industry analyst in the Department's Office of Basic Industries, predicted that 1986 glass container shipments would be down from 1985. But the Department's recently-released report for the first 10 months of 1986 showed glass containers up substantially over the previous year—243,359,000 gross units vs. 233,945,000 for 1985.

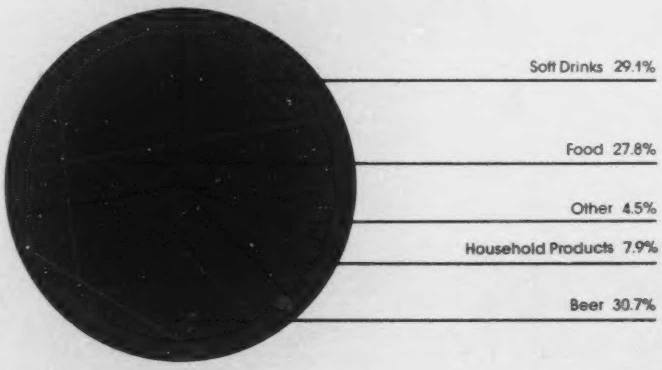
This development suggests that Blassey's forecast for glass containers through 1990—average annual declines of 0.5 per cent—needs revision. "Glass is on the upswing," said Howard Balogh of the Glass Packaging Institute.

New ideas for glass

While PET continues to cut into glass' clear-container territory, the makers of glass containers are not conceding the food and beverage packaging market to anyone. This is indicated by the activities of International Partners in Glass Research, a consortium of glass containers manufacturers, which is supporting a dozen R&D projects aimed at dealing with glass' main problems:breakability and weight.

Among the ideas developed

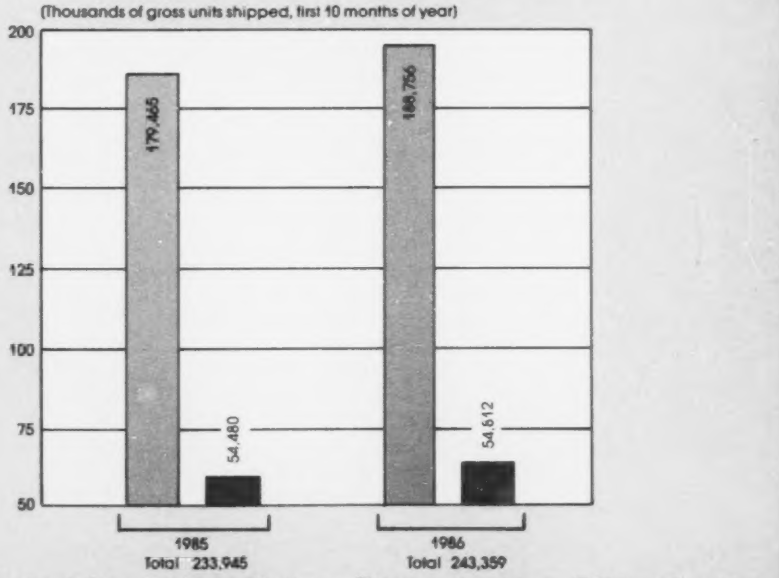
DISTRIBUTION OF RIGID CONTAINERS, END USE MARKETS—1986



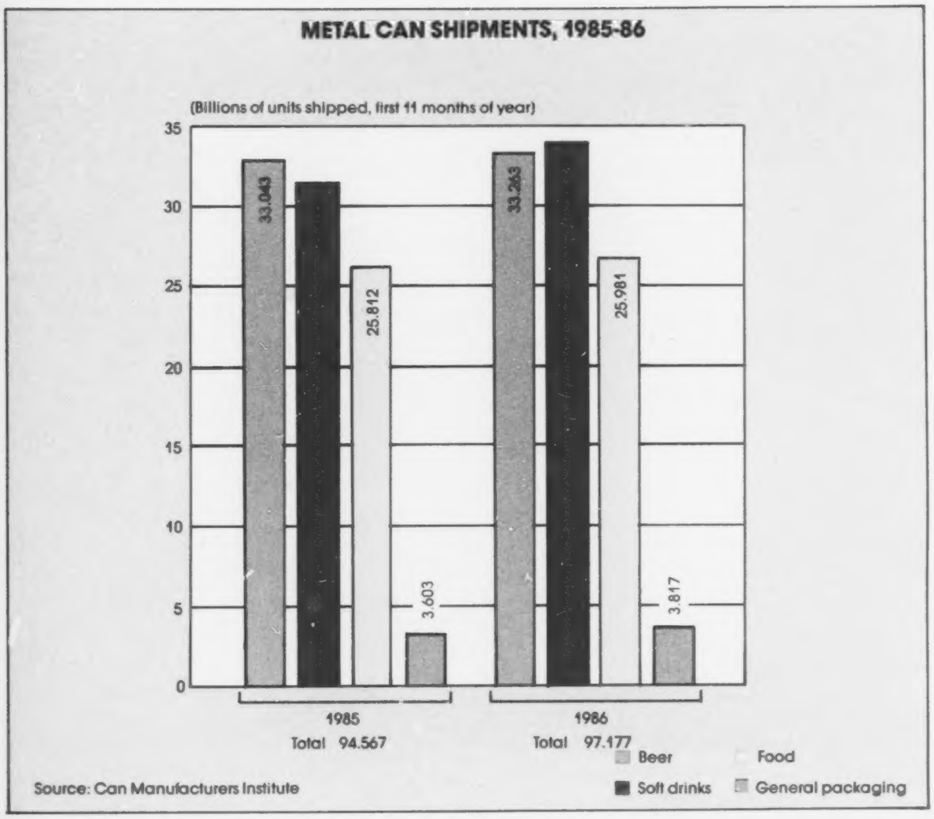
(Total unit shipments as per early 1986 Bureau of the Census, U.S. Dept. of Commerce projections)

Sources: Bureau of the Census, Can Manufacturers Institute and International Trade Administration

GLASS CONTAINER SHIPMENTS, 1985-86



Source: U.S. Department of Commerce, Bureau of the Census


METAL CAN SHIPMENTS, 1985-86

Source: Can Manufacturers Institute

under the IPGR aegis: engineered structures of multilayer glass and high-impact silicate coating that have already demonstrated a major improvement in resistance to breakage.

Regarding metal cans, Blassey projected 1986 shipments of 102.5 billion units vs. an estimated 100.5 billion for 1985 and average annual gains of 1 per cent through 1990. The Can Manufacturers' Institute recently reported a final figure for 1985 of 101.924 billion. CMI's latest figures for 1986 are 97.177 billion units for the first 11 months vs. 94.567 billion for the same period in 1985.

As with glass, Blassey's projection for growth through 1990 could be conservative.

The report sees plastic bottles (blow-molded) as the fastest-growing of rigid containers through 1990 with an average annual growth rate of 4 per cent. Blassey projected a total for 1986 of 18.7 billion units, up from its estimate of 18.1 billion in 1985. As it developed, these numbers were conservative.

The Department of Commerce won't have 1986 totals for plastic bottles until midyear but their final figures for 1985—20.2 billion units—top the Outlook report's estimate for that year by 2.1 billion. This suggests that plastic bottles should do better through 1990 than Blassey's 4 per cent prediction.

The report further noted that beer, food and soft drinks accounted for an estimated 87 per cent of all rigid container shipments in 1986. Increased demand for packaged carbonated soft drinks was the only major growth area.

Blassey cited as a strong growth-slowing force the slowdown in packaged-beer sales caused primarily by market saturation and increasing consumer interest in non-alcoholic beverages. He expects that unit shipments of food containers will decline because of changing consumer requirements and tastes. The remaining markets—household chemicals, toiletries and medicines—are static or growing marginally.

An increase in regulatory activity—in response to increased pressure from consumer groups—also has considerable growth-inhibiting potential for beverage containers.

Solid waste problem

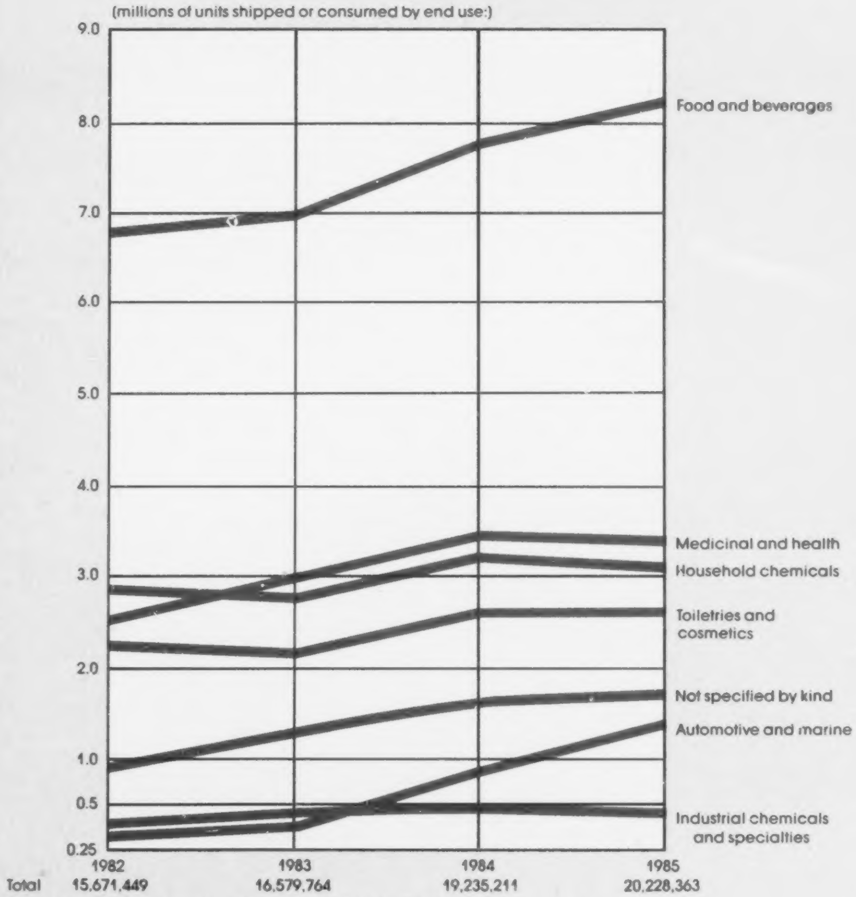
Mandatory deposit laws and growing concern for solid waste problems are a fact of life in several states including such high population states as New York and Michigan.

The scope of recent activity is exemplifed by proposed New Jersey legislation that would require recycling of a wide range of containers, including plastic and bimetal containers. Containers not achieving a 55 per cent recycling rate within 18 months after enactment of the law would be subject to deposit. Douglas Smock, editor of *Plastic World*, observed recently that New Jersey is "almost certain to pass a bill on solid waste this year."

Well-established industry recycling programs for aluminum address part of the problem but as yet there is no comparable effort for steel beverage cans or glass or plastic containers.

Blassey foresees continued market share gains for aluminum cans because of their dominance in beverage packaging. Aluminum can shipments rose from 16.3 billion units in 1975 to 66 billion in 1985 when they accounted for 94 per cent of beverage can shipments and 66 per cent of

PLASTIC BOTTLES (BLOW MOLDED) 1982-85



Revised by 5 per cent or more from previously published figures.
The total represents all blow molded and injection blow molded bottles produced, including produced and shipped as well as consumed.

Source: U.S. Dept. of Commerce, Bureau of the Census and The Society of the Plastics Industry, Inc.

all can shipments. This contrasts with 20 per cent of both categories 10 years earlier when steel dominated the can market.

The report projected a decline in shipments of metal cans for food from 27.1 million units in 1985 to 26.7 units for 1986. Cited as major factors in this trend were reduced preparation of food at home which reflects the continuing trend to smaller families and working mothers. Increased use of frozen convenience foods is also cutting into the market for food cans.

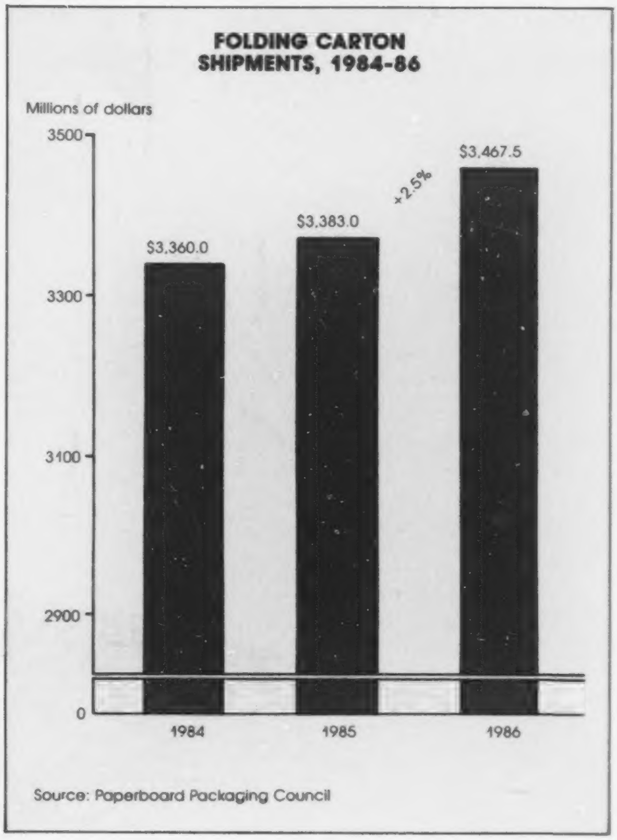
While acknowledging that plastic food containers are a growing challenge, Blassey anticipates that metal cans, mostly steel, will continue to dominate food packaging through 1990.

In Blassey's view, a large problem for glass containers is lowered demand for glass containers by producers of beer, food and soft drinks which combined represent about 86 per cent of total glass container shipments.

The principal factor here is a decline in glass beer bottles caused mostly by the major brewers' preference for aluminum cans. In addition, Blassey noted, large-size glass soft-drink containers have yielded almost totally to the 2- and 3-liter plastic bottle. Beer remains, however, the biggest market for glass containers accounting for more than 32 per cent of 1986 shipments.

In forecasting growth for plastic bottles Blassey contends that the "basic demand factor" for growth is manufacturer efforts to improve the container in two areas: "First, correct decarbonation to expand consumer acceptance of the 1/2-liter soft drink bottle and second, to improve co-extruded and multilayer plastic food containers for better performance at competitive costs." He expects severe price competition to develop between glass and plastic bottles. ■

THE OUTLOOK FOR PAPERBOARD AND CORRUGATED



Source: Paperboard Packaging Council

Corrugated and solid fibre boxes, folding paperboard boxes, rigid (set-up) paperboard boxes and sanitary food containers all experienced growth in 1986. The U.S. Department of Commerce expects growth to continue in all of these areas through 1990.

According to the Fibre Box Association corrugated and fibre boxes set a new all-time high record for shipments in 1986—283.6 billion square feet shipped, 6.0 per cent higher than 1985 shipments.

The Association reported that consumption of paperboard for 1986 was 20,967,607 tons, 5.4 per cent higher than 1985 consumption and also a new record.

On the folding carton front, the Paperboard Packaging Council reported that December, 1986 dollar volume of nearly $314 million was 11.1 per cent better than December, 1985 and set a record for December billings. In the final quarter 1986 was 5.6 per cent better than 1985.

The Council further reported that preliminary indications for all of 1986 would probably reach $3.5 billion, 2.5 per cent better than 1985. Subject to revision in the Council's Marketing Guide, these numbers represent a new record for annual dollar volume of folding carton industry shipments.

With a substantial portion of its members providing data, the 340-member National Paperbox & Packaging Association, mostly independent producers, reported 1986 folding carton sales volume of $382,545,909 vs. the 1985 total of $355,902,110 and rigid box volume of $109,466,500 vs. 1985 figure of $106,065,440.

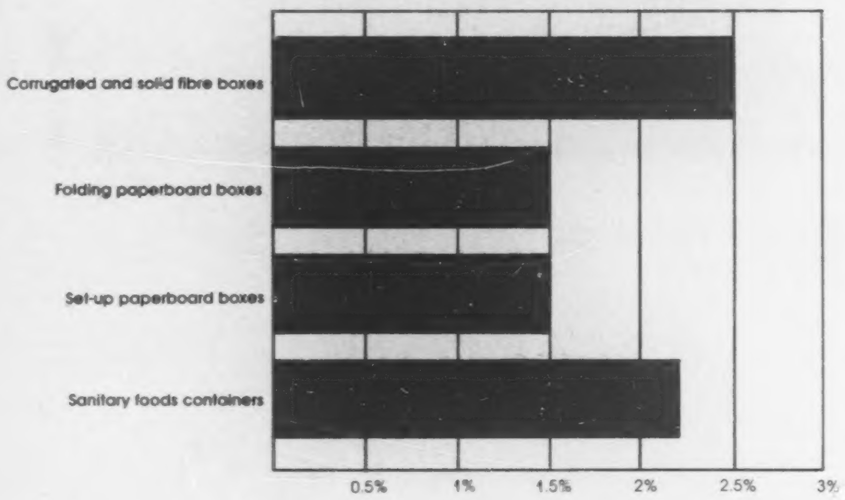
The U.S. Department of Commerce's Office of Forest Products and Domestic Construction 1986 figure for sanitary food containers is 2.2 per cent better than 1985.

These numbers indicate that the Department of Commerce is not overly optimistic in foreseeing continued growth in these areas.

Looking four years down the road in a report in the current edition of its annual U.S. Industrial Outlook, the department sees corrugated and solid fibre boxes as the growth leader with an average annual increase of 2.5 per cent through 1990. The other growth rates: sanitary food containers, 2.2 per cent; folding paperboard boxes, 1.5 per cent; set-up paperboard boxes, 1.5 per cent.

Author Leonard S. Smith of the Commerce Department's Office of Forest Products and Domestic Construction, cites the following as growth factors for corrugated boxes:

1. Continued development of multi-ply box technology.
2. Increased use of flexography in color printing.
3. Further improvements in graphic design.
4. Greater use of preprinted linerboard in box construction.
5. Further computerization and automation of plant operations.
6. Better marketing and distribution methods.
7. Modifications of existing box specifications for com-



ANNUAL GROWTH RATES, 1986-1990:

Source: Office of Forest Products and Domestic Production, U.S. Dept. of Commerce

pression and burst strength.

8. Improved coatings and adhesives.

9. Increase in the number and variety of corrugated/plastic combinations.

Acknowledging that plastics will continue to make inroads into traditional corrugated markets, Smith predicted that paperboard producers would hold their own by diversifying into new market areas. He expects most of the market growth to be in shipping containers and displays for paper and allied products, miscellaneous plastic materials, glassware and electrical equipment.

Folding paperboard boxes

Smith cites improvement in consumer disposable income and a generally brighter U.S. economy as the principal factors in the 1986 gain for folding paperboard boxes.

In predicting a continuation of this progress through 1990, Smith named these main growth factors: Continuing albeit slow growth in consumer nondurables. A gradual rise in consumer disposable income. Continued moderation of inflation and modest rises in costs of energy, raw materials and labor.

Smith expects the box makers to continue to improve the quality/appearance of their products through better package design and graphics. Also foreseen: Increasing productivity by increasing use of improved equipment for cutting and creasing boxes after printing. Infrared ink-curing to reduce the delay between carton printing and cutting/creasing. Automation and computerization in manufacturing and distribution.

As the trend to greater consumption of single-portion meals continues, it is expected that the industry will increase its presence in packaging for fast food and convenience foods.

Set-up paperboard boxes

Growth in consumer disposable income which encourages purchases of luxury nondurable goods was seen as the main factor behind the 1986 increase for set-up, or rigid, paperboard boxes.

The Department's predicted average annual growth rate of 1.5 per cent for 1986-90 is based on continued albeit slow growth in high-valued nondurable goods in combination with the industry's ability to enter new markets.

The principal markets will be packaging for cosmetics, pharmaceuticals, confectionery and electronics. Competition from plastics and other forms of packaging will continue but set-up boxes are expected to keep their share of the high-value specialty packaging market.

Sanitary food containers

The climb of 2.0 per cent in the real value of sanitary food-container shipments in 1986 more than compensates for the 0.5 per cent decline of 1985. Again, greater consumer spending is a factor.

Smith reported a 1986 increase in sales volume for paperboard carton milk cartons, the gain at the expense of plastic milk containers. He also noted continuing growth for aseptically packaged juices and drinks but not for aseptically packaged flavored milk whose progress is hampered by consumer reluctance to change buying habits and tastes in this area.

The 2.2 per cent average annual growth rate seen for sanitary food containers through 1990 assumes gradual gains in retail food sales and continued growth for fast food and convenience food services.

Also predicted through 1990: Aseptics will continue as an industry growth leader, expanding to different types of packaging systems and to increased diversity of foods and beverages. Ovenable trays will continue to grow albeit at a slower rate than previously anticipated. Plastics will continue to vie vigorously with paperboard in most product areas, including aseptics. ■

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/APRIL 1987

Non-Frozen Meals Try New Packages

Packaging Line Pays-Off In Year

How Campbell Tests CPET Trays

Drug Packagers Face New Challenges

Case-Packing Analysis Yields Savings

Tough Label Liner Cuts Downtime to Zero

Senior Citizens Want Improved Packages

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New challengers to frozen meals' supermarket reign are (far left) Culinova's dual-ovenable refrigerated meals and two shelf-stable microwavable entrees, Hormel's Top Shelf and General Foods' Impromptu.

ALTERNATIVES TO FROZEN MEALS

New packages hit the market for refrigerated meals and shelf-stable entrees. At stake is the huge—$4 billion and growing—market for frozen meals

By Ross Heuer Senior Editor

A line of dual-ovenable refrigerated meals with three to four weeks' shelf life and two lines of shelf-stable microwavable entrees are challenging frozen foods' long-established supermarket reign.

The three new challengers:

Culinova Group's controlled-atmosphere, refrigerated gourmet meals in dual-ovenable packaging that preserves freshness for three to four weeks. Culinova is a General Foods subsidiary.

George A. Hormel & Co.'s Top Shelf, billed as "the first shelf-stable entree designed especially for the microwave." Vacuum-packed in a multi-layered tray, entrees stay fresh without refrigeration for "18 months or longer."

General Foods' Impromptu shelf-stable, dual-ovenable entrees. Packed in crystallized PET trays and said to have 12-month shelf life.

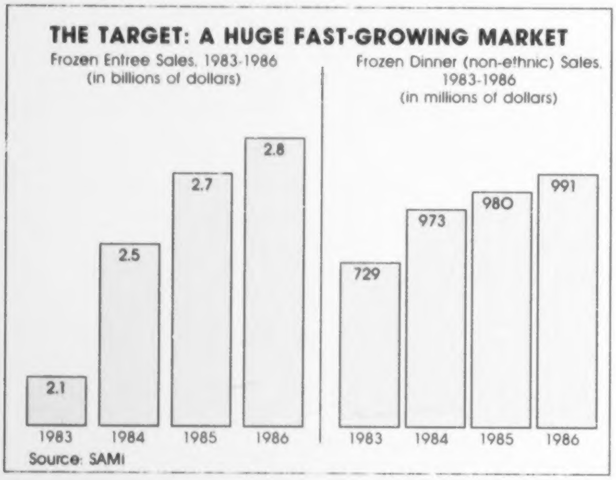
"Refrigerated prepared gourmet meals" is not as yet an established supermarket product category but it may well achieve that status if the combination of upscale comestibles and unique dual-ovenable packaging developed by Culinova continues to win consumer acceptance.

The Hawthorne, N.Y. company's new line of refrigerated meals is clearly aimed at consumers whose tastes are at the upscale end of the ready-to-eat food spectrum and who perceive "refrigerated" foods as truly fresh, a status they would not confer on frozen or canned foods.

Currently in test market in selected supermarkets in Connecticut's Fairfield County, New Jersey's Bergen County and New York's Westchester County, the Culinova dinners retail in the $3.50 to $7 range. There are six dinners: Lasagne Florentine, Chicken Marinara, Chicken Dijon, Rock Cornish Hen Mourisca, Veal Vendee and Sole in Saffron Sauce.

The main components of Culinova's innovative package—a winner in recent packaging competitions conducted by DuPont and SPHE—are a transparent plastic dome, a plastic platter, a shrink bag and a wraparound paperboard sleeve. This combination affords the shopper an eye-catching view of the product

Hormel feels that Top Shelf represents the beginning of a new aisle in supermarkets across the U.S.



The innovative new products from General Foods and Hormel are aimed at a huge market that, mirroring the national appetite for convenience, is experiencing dramatic growth. Last year sales volume for entrees was up $718 million from 1983 and $52 million higher than 1985. Frozen dinners (entree plus vegetables, potatoes, dessert, etc.) were $262 million higher in 1986 than in 1983 and $11 million higher than 1985.

and incorporates unique techniques for consumer protection and for controlling the food's micro-environment.

According to Terry Taylor of the Culinova Development Team, the package maintains control of the micro-environment against the unstable elements encountered throughout the distribution process. It provides what Taylor terms "high quality freshness" for three to four weeks under normal refrigerated conditions.

Concerning the package's point-of-purchase impact, Taylor declared, "Inherent in the design is the tremendous visual appeal of this unique package—the customer can actually see the high-quality culinary configurations and beautiful colors through the clear see-through dome."

The oval-shaped plastic platter (10-5/8 inches × 6-5/8 inches × 1-inch deep) is microwavable, ovenable, reuseable and disposable. It can be used as serving platter or dinner plate.

The transparent dome, 10-9/16 inches × 6-9/16 inches × 1-3/4 inches high, fits the platter and provides the consumer with maximum visual product presentation and adequate top/bottom compression strength. It serves as a splatter shield during microwave cooking. The base of the dome is flanged for snug fit inside the platter bottom.

The 8 × 14-inch hermetically-sealed barrier shrink bag is the main barrier to hold in the modified atmosphere and inhibit microbial activity. It is opened via a pull tab at the top of the package.

Consumer protection is enhanced by a computer-aided laser beam-based polymeric strip safety bar code system that changes color when the product has been exposed to temperatures below refrigeration level. In addition, the consumer can easily see if the shrink wrap has been punctured or opened.

The wraparound SBS paperboard "hatband" sleeve (26-7/8 inches long × 2-3/8 inches high) is doubled over and glued to form a collar. The sleeve has die-cut slots that mesh with handles on both ends of the tray.

Graphics are designed so that pressure sensitive labels can be hand-appplied to the generic hatband. This allows maximum labeling flexibility which is needed for seasonal changes of food components accompanying the basic entree.

A black and gold label bears the entree name and identifies seasonal components. A burgundy and gold label conforms to FDA/USDA ingredient and nutritional labeling requirements.

Top shelf

Top Shelf's 10-entree line-up which represents Hormel's debut in the microwavable dinner field began testing in Indianapolis.

The multi-layered, plastic serving dish is sealed airtight with an easy-open lid. The trays are thermoformed by Continental Can which worked with Hormel in development of the Top Shelf package.

The tray sheet is an unbalanced four-ply polypropylene structure with Saran from Dow Chemical as its barrier layer.

The lid structure includes foil and the barrier material and several layers of other resins. The lid is semi-rigid to complement the tray structure in the retort and in distribution.

The 2-minute Top Shelf selections, ranging from Breast of Chicken Acapulco to Boneless Beef Ribs, are aimed at higher-income adults, ages 25 to 54, and Hormel recommends that they be positioned near dry pasta and spaghetti sauce products. Retail price range is $1.69 to $3.39.

According to Hormel, Top Shelf represents "the beginning of a new aisle in the supermarket—the "freezer free aisle of microwave entrees."

Impromptu

Impromptu's 10 entrees began their limited test in Evansville, Ind. and Portland, Maine. They retail in the $1.69-$2.79 range.

The products are packed in crystallized PET trays, sealed with foil-based lidding material and domed with opaque white plastic. Dome composition is at the moment a well-guarded secret as is the method for achieving 12-month shelf life.

Trays nestle into die-cut cartons. Entree variety is depicted by an outer paperboard sleeve. The whole assembly is shrink wrapped.

Package copy explains that the product's ingredients are "cooked to their steaming peak of perfection" and therefore stay fresh without refrigeration, freezing or preservatives.

However, the copy stresses that the entree must be refrigerated after opening. There are careful directions for both conventional and microwave ovens plus a line drawing depicting the plastic dome being used for microwave cooking only.

In addition, there is an 800-number for consumers to call with questions or comments. ■

ROSS HEUER
Senior Editor

America's growing appetite for convenience in all things is a continuing challenge to package designers. Nowhere is the effort to develop innovative packaging ideas more intense than in the prepared food market.

IMPORTS, EXPORTS RISE FOR MACHINERY IN '86

One potential untapped market is the USSR

According to the U.S. Industrial Outlook 1987, imports of food and non-food packaging machinery registered their sharpest increase of the decade last year while exports also rose slightly, reversing a four-year decline. Food and non-food packaging machinery imports totaled an estimated $528.1 million last year.

Packaging machinery exports rose 2.4 per cent in 1986, reaching $278.3 million from $271.8 million in 1985, as exporters shipped products to 111 foreign markets. Leading customers by sales volume were Canada, the United Kingdom, Japan, Australia and Germany. One hot spot for exporters is the Pacific Basin. Exports to South Korea, for example, hit $16.3 million in 1986 after reaching only $4.7 million in 1985.

U.S. food products machinery companies exported a record $6.4 million to the Soviet Union last year compared to an average $4 million between 1980-1985. Under the auspices of the U.S. Dept. of Commerce, more than 60 companies from the industry participated in INPROD-TORGMASH in Moscow last September, the first major international food equipment show staged in the USSR.

Shipments by the food products and packaging machinery industry are forecast to rise 2.5 per cent in 1987.

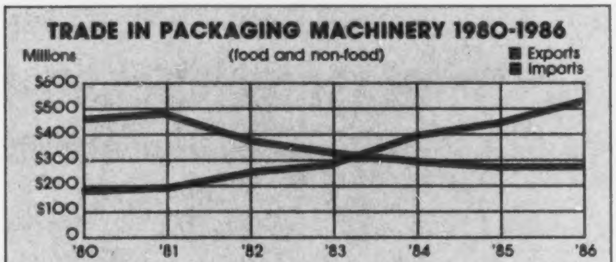
MORE FOODS IN T-E CONTAINERS: STUDY

Use of T-E packaging up, but not for all foods

According to a 1984 study by two Cornell University professors, less than 1 per cent of all food products had tamper-evident packaging that would have met FDA regulations for over-the-counter drugs.

These results were recently upgraded in a 1986 study conducted by Rexham Machinery Group, Sarasota, Fla. The Cornell study itemized 29 groups of food products and their packages into four categories: (1) Likely to meet FDA regulations and also carries a label statement; (2) Likely to meet FDA regulations, no label statement; (3) Unlikely to meet FDA rules, though package has some degree of tamper evidence; and (4) Container has no tamper-evident feature.

TRADE IN PACKAGING MACHINERY 1980-1986

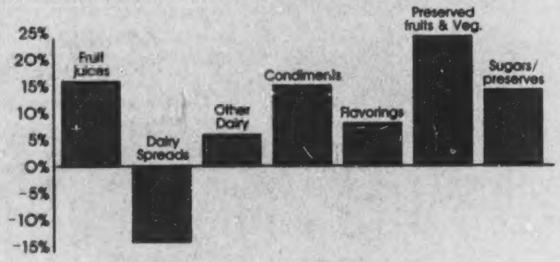


Source: Industrial Outlook 1987

Machinery imports continued rising in 1986, exports rose slightly, reversing a four-year decline.

FOOD ITEMS ADDING TAMPER-EVIDENT FEATURES

(percentage change since 1984)



Source: Rexham Machinery Group

PACKAGING LEADTIMES (in weeks)

	Feb. '87	Jan. '86	Feb. '86
Metal cans	3.5	3.7	3.4
Composite cans	4.4	3.3	3.5
Glass containers	4.0	4.7	4.9
Plastic bottles	3.8	3.2	3.8
Plastic film	4.0	3.5	3.6
Laminates	5.5	5.3	5.0
Corrugated containers	2.9	2.9	3.0
Multiwall bags	4.4	4.3	4.4
Kraft paper	3.0	3.2	2.7
Folding cartons	3.9	3.9	3.5
Fiber drums	3.0	2.9	2.6
Industrial crates	3.3	2.8	3.1
Strapping	2.6	2.7	2.5
Steel drums (shipping)	3.7	3.5	3.1
Pallets	2.8	2.5	2.9

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES

	Feb. '87	Jan. '86	Feb. '86
Aluminum can stock ($/lb.)	1.08	1.07	.98
LDPE/liner($/lb.)	.29	.28	.33
LDPE/clarity($/lb.)	.33	.33	.37
LLDPE/butene($/lb.)	.28	.28	.32
LLDPE/octene($/lb.)	.35	.33	.37
HDPE/blow molding($/lb.)	.32	.34	.34
HDPE/film grade($/lb.)	.35	.35	.36
Polystyrene/general purpose($/lb.)	.37	.36	.34
Polystyrene/impact($/lb.)	.38	.37	.38
PVC/general purpose($/lb.)	.32	.31	.32
PP/homopolymer($/lb.)	.36	.36	.35
PP/copolymer($/lb.)	.46	.46	.47
ABS($/lb.)	1.01	.98	1.01
Unbleached kraft/shipping sack($/ton)	430	430	390
Unbleached kraft/grocery sack($/ton)	375	375	275
Linerboard, 42 lb. east($/ton)	350	350	260
Linerboard, 42 lb., west($/ton)	360	360	260
Corrugated med., semichemical($/ton)	320	320	235
Recycled folding boxboard, clay coated($/ton)	400	400	375
Recycled folding boxbd., chipbd.($/ton)	320	320	290
Bleached kraft, folding carton($/ton)	570	570	545

Source: Purchasing, a Cahners publication

Of the 29 categories examined, the seven which rated worst in terms of tamper-evident packaging were fruit juice and drinks, dairy spreads, other dairy products, condiments and dressings, flavorings, preserved fruits and vegetables and sugars and preserves.

Since 1984, according to the Rexham work, most of these categories have shown decreases in the number of products without tamper-evident packaging. Preserved fruits and vegetables dropped 24 per cent, fruit juices declined 16 per cent and condiments went down 15 per cent. However, the amount of dairy spreads without tamper-evident features rose 14 per cent.

MAJOR BOX MAKERS REPORT PRICE HIKE

Price rise to follow linerboard price increases

U.S. box producers are reportedly making an effort to raise corrugated box prices to keep pace with linerboard price increases from $320/ton in 1986 to $350/ton effective Jan. 1. Prices have been reported slightly higher, $360/ton, on the West Coast.

Box companies that have announced price increases of 10 per cent or more effective with January shipments include Stone Container Corp., Union Camp, International Paper, Jefferson Smurfit Corp. and Packaging Corp. of America.

MORE STATS . . .

1986 fiber box shipments totaled 283.6 billion square feet, 6 per cent higher than 1985 and the highest year in history, according to the **Fibre Box Association**. Containerboard consumption also set a new record at 20,967,607 tons, 5.4 per cent higher than 1985 . . . **PMMI** reports that packaging and packaging-related converting machinery orders for December were up 0.3 per cent from November and up 11.1 per cent from December 1985. Year-to-date orders are 2.1 per cent ahead of 1985 . . . The current market for flexible lidding materials could reach 150 billion square inches, according to the **Reynolds Metals Co.** . . . Metal cans account for 42 per cent of the $17.9 billion U.S. soft drink market, according to a new study by **Business Trend Analysts**. PET bottles weigh in at 27 per cent.

SENIOR CITIZENS WANT IMPROVED PACKAGE GRAPHICS

Most discretionary dollars are in the hands of a fast-growing and largely neglected market—consumers over 55. To tap this market packaging graphics must accommodate impaired vision and other problems that go with advanced years

Who's invisible yet controls some 70 per cent of the worth of U.S. households?

"The mature market, the population over 55," says packaging consultant Herbert M. Meyers. "They're virtually unseen in advertising and marketing media."

And, contends Meyers, this neglect makes no sense: "People over 50 control about $7 trillion of wealth. The over-55 group, 22 per cent of our population, wields more discretionary dollars than any other age group—including the yuppies."

According to Meyers, managing partner of Gerstman+Meyers, Inc., a New York-based design and marketing communications firm, this neglect of an important market will soon end.

In a Pack Expo '86 presentation titled "Packaging For The Elderly—New Graphic Dimensions" Meyers asserted that marketers will soon be taking notice of this fast-growing segment and consumer product packaging will have to change to accommodate vast numbers of shoppers with impaired vision and other problems of advanced years.

His views supported by recent focus group findings, Meyers examined the ways that these problems relate to specific elements of packaging, the nature of changes needed and the scale of the market.

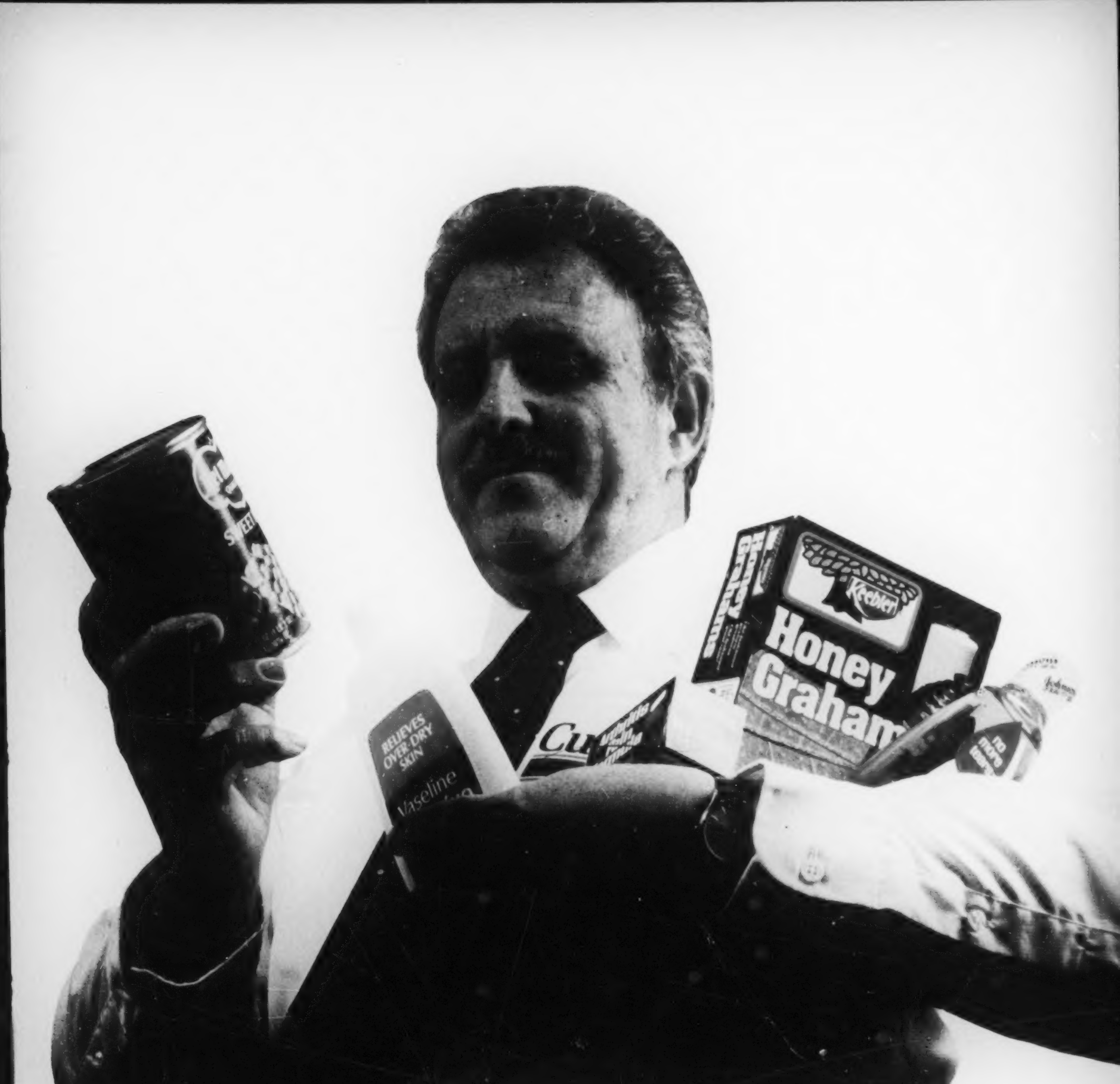
Noting that while yuppies are perceived by many marketers to have more spending power than older consumers, Meyers noted that the ever-growing senior segment controls 34 per cent of family purchasing decisions and buys, among other things, 30 per cent of all food consumed at home.

"Products and packaging for this growing market must consider the special needs and limitations of mature consumers, especially those with declining visual and motor capabilities," said Meyers. He identified problems that can make supermarket shopping difficult for older shoppers:

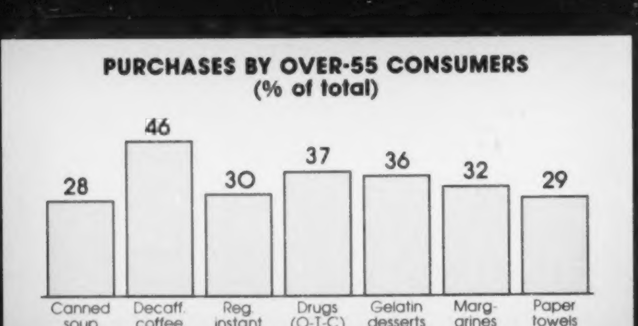
- By age 65, abilities to focus, resolve images, distinguish among colors and adapt to different lighting conditions diminish. Increased opacity of the eye, including cataracts and clouding of the lens of one eye, reduces the amount of light that enters. This makes the contrast level of any visual material a critical design element.
- The greater the contrast between two colors, or between an image and its background, the easier it is to see. The juxtaposition of black and white provides the greatest contrast but excellent contrasts can be obtained by many color combinations.
- Yellowing of the eye may reduce reception of violet light and result in difficulty discerning among blues, greens and violets. Red, oranges and yellows cause fewer color- perception problems. When colors are too close to background colors, legibility deteriorates for anyone, but especially for the elderly.
- Diminishing ability to focus impairs an elderly person's perception of small forms and letters. Small, crowded type on a label is hard to read as are very ornate typefaces. Use of simple letters, with adequate spacing between letters and lines of type, as well as good contrast, increases readability, even under adverse lighting conditions.
- Scripts and other ornate types may communicate quality, but obscure communications if not handled carefully to avoid visual clutter on the label.
- These impairments also mean that smaller blocks and short lines of copy are easier to read than copy arranged on long, extended lines. Additionally, readability is facilitated for the elderly by arrangements that give visual clues to the reader such as frequent indentation or standard capitalization.
- The visually impaired have more difficulty registering new images clearly because there is greater carryover from surrounding images, colors and shapes. The avalanche of images in supermarkets obscures the vision of the elderly by producing imagery overload.

Focus groups

Gerstman+Meyers recently conducted several focus groups with over-60 consumers. The groups concentrated on graphics for well-known brands in various categories


SWEET
RELIEVES OVER-DRY SKIN
Vaseline
Cu
Keebler
Honey Grahams
Honey
Graham

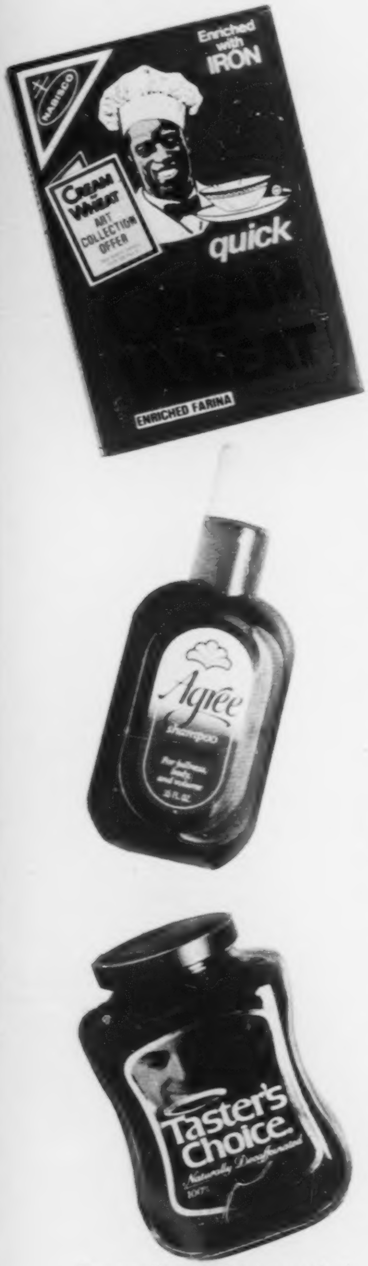
Easy-to-read lettering was among the features that won senior focus group plaudits for packaging of Keebler Honey Grahams, Del Monte canned peas, Arthritis Pain Formula, Johnson's Shampoo, Curel Skin Lotion and Vaseline Intensive Care skin lotion.



Source: American Association of Retired Persons

Underscoring AARP's figures (above) is a Gallup study which indicates that 30 percent of all food consumed at home is purchased by consumers over age 55.

Health benefits should be presented in impactful fashion



Among the problems noted by some of the panelists: Distinguishing the dark blue logo on the Cream of Wheat package's red background, difficulty reading Agree Shampoo's green label and—because of the small script— identifying Decaf on the Taster Choice jar.

and paid only minor attention to structural problems.

Categories included: canned coffee, instant coffee, canned soup, arthritis medication, sinus medication, antacid, skin lotion, shampoo, hair conditioner, household cleaner and paper towels.

Discussion and questions focused on readability, color, color-coding and product impression, ambience and imagery and overall impression. Questions unique to each set of products such as the value of specific illustrations were included.

The panelists' views

In the hot-cereal group, panelists viewed the Wheatena carton as an example of providing reassuring and important benefits to the elderly. Such benefits as no sugar and highest fiber are prominent in the front panel. The brand name is in easy-to-read white letters on a dark blue band. However, the panelists thought the package looked cluttered.

The Cream of Wheat package was criticized for the difficulty of distinguishing the dark blue logo on the red background.

Among the graham cracker packages Keebler Honey Graham was praised as appropriately old-fashioned. The panelists liked the product photography in close proximity to the logo, making the crackers more visible and appetizing.

The Honey Maid name confused some panelists. One asked, "What does Honey Maid mean?" But the Nabisco corporate endorsement was considered reassuring as to product quality.

The script typeface on the Stella D'Oro Breadstick packages was rated hard to read but panelists said that they recognized it in the stores.

There was no problem distinguishing between Sesame Breadsticks and Dietetic Breadsticks, but some panelists were confused regarding the meaning of the term "dietetic." Most panelists thought it meant low in sugar rather than low in salt. All agreed that this confusion would be eliminated if the small explanatory copy under "for sodium-restricted diets" were enlarged.

The red "No Salt Added" statement on a Del Monte canned pea label was judged extremely clear.

Instant coffee provided another situation in which product variety cues were confusing. The panelists considered Taster's Choice jars difficult to differentiate because of the small script lettering identifying the decaffeinated label. The males didn't see this as a problem since they knew that the color green indicates decaf but the female panelists want the designator to be clearer.

On the other hand, while the men felt that the word "instant" on the Maxwell House jar should be clearer, the women didn't—they know that coffee in a jar is instant.

In the personal-care categories readability was a major issue. Among shampoos, Flex was considered attractive despite the hard-to-read gold print but there was confusion as to whether it was a shampoo or conditioner. Johnson's was liked for the contrasting blue lettering. Agree's label was considered difficult to read and its green label inappropriate for shampoo.

In skin lotions, the Curel package was rated outstanding—crisp, clear, easy to read. Niven's white, highly stylized logo was found more difficult to read. Product information presentation was clearest on the Vaseline Intensive Care package, displayed at the top of the front label.

From the data collected Gerstman + Meyers drew the following general conclusions:

Elderly consumers are very "information sensitive" —they read labels very carefully, especially ingredient and nutritional information which pertain to dietary restrictions; preparation instructions; weight or serving size, which impacts on the price-value relationship; and expiration dates.

Because of elderly consumers' high degree of brand loyalty, equity of established brands is an important consideration in package redesign. Similarly, because these consumers tend to try new products based on exposure via advertising and coupons, the relationship between the package and these media becomes much more critical.

For the elderly, information must be conveyed clearly. Health benefits such as low-salt should be presented in uncluttered, impactful fashion—even at the expense of other elements of the package design.

Preparation directions and storage information must also be communicated clearly and legibly. In a category of seemingly equivalent products, one brand might carve a niche for itself with mature consumers vis-a-vis competitive brands by virtue of the superior communications ability of its packaging.

Finally, because these are price-conscious shoppers, the package must maximize the price/value relationship of the product.

Areas for improvement

Gerstman + Meyers concluded that in packaging, the areas with greatest potential of meaningful visual material for the older consumer include:

(1) Strong emphasis on brand identification, especially for well known brands.

(2) Clear, legible product designators.

(3) Bright, contrasting colors to enhance visibility.

(4) Simple, typographic styling of all copy.

(5) Large, open and carefully placed secondary copy relating to directions for use, nutritional and dietary information, cautionary statements, contents information, etc.

(6) Maximize emphasis on nutritional and dietary benefits.

(7) Less reliance on color-coding—more emphasis on clear verbal product differentiation.

(8) Good price/value communication. ■

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5/14/87

PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/MAY 1987

Seagram's Policy: 'Zero Defects'

Execs Look For Innovations

Big Names Switch To Dispensing Closures

21 Ways To Reduce Line Accidents

Packagers Want Simple Machines

How To Get Peak Output

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PEA
FLAVOR
WINE CO
NET CONT. 12 FL. OZS. (355 ML)

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A CAHNERS PUBLICATION
VOLUME 32 NUMBER 7

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RETORTABLE PLASTICS WORTH $320MM BY 1991

Unit sales to hit 4.7 billion by same time

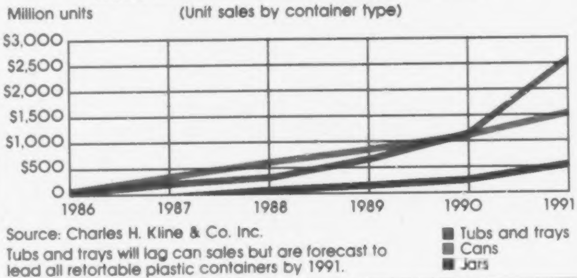
Sales of retortable rigid plastic containers for shelf-stable food products will reach 4.7 billion units, worth nearly $320 million by 1991, according to Charles H. Kline & Co. Inc., Fairfield, N.J.

More than 75 per cent of these cans, jars, trays and tubs will be used to package new specialty food products that require no refrigeration and can be microwaved. The remainder will find uses for traditional food products at the expense of glass jars and metal cans in selected retort applications.

According to the report, "Retortable Plastic Containers," new specialty foods will consume roughly $240 million of retortable plastic containers by 1991. Likely products packaged in these containers include meat entrees, pastas with sauce, complete dinners and side dishes. Existing retorted food products, such as baby food and soup products, will garner an additional $80 million.

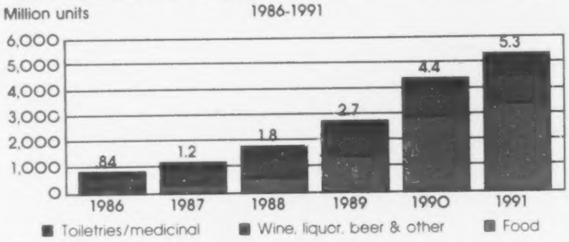
Initially, plastic cans are forecast to grow faster than thermoformed trays and tubs because of the suitability of existing metal and glass container filling and retort lines. However, the report predicts tubs and trays will surpass plastic cans beginning around 1990 due to their lower relative cost and increased functionality as serving containers. By 1991, the study predicts, thermoformed tubs and trays will account for 46 per cent of total dollar sales for retortable rigid plastic containers.

RETORTABLE PLASTIC CONTAINERS



Source: Charles H. Kline & Co. Inc.
Tubs and trays will lag can sales but are forecast to lead all retortable plastic containers by 1991.

PET CUSTOM CONTAINER DEMAND BY INDUSTRY



Source: PET resin producer projections
PET containers are forecast for increased growth between 1989 and 1991

PACKAGING LEADTIMES (in weeks)

	Mar. '87	Feb. '87	Mar. '86
Metal cans	3.4	3.5	4.7
Composite cans	3.4	4.4	4.9
Glass containers	4.1	4.0	4.8
Plastic bottles	3.6	3.8	4.0
Plastic film	4.0	4.0	4.1
Laminates	4.5	5.5	4.9
Corrugated containers	2.9	2.9	3.1
Multiwall bags	4.7	4.4	3.9
Kraft paper	3.5	3.0	3.3
Folding cartons	4.2	3.9	3.7
Fiber drums	3.1	3.0	3.8
Industrial crates	2.9	3.3	3.7
Strapping	2.6	2.6	2.7
Steel drums (shipping)	3.0	3.7	3.8
Pallets	2.6	2.8	2.8

Source: Purchasing, a Cahners publication

TRANSACTION PRICES

	Mar. '87	Feb. '87	Mar. '86
Aluminum can stock ($/lb.)	1.10	1.08	1.00
LDPE/liner($/lb.)	.28	.29	.33
LDPE/clarity($/lb.)	.33	.33	.37
LLDPE/butene($/lb.)	.28	.28	.32
LLDPE/octene($/lb.)	.34	.35	.38
HDPE/blow molding($/lb.)	.32	.32	.34
HDPE/film grade($/lb.)	.35	.35	.37
Polystyrene/general purpose($/lb.)	.40	.37	.34
Polystyrene/impact($/lb.)	.43	.39	.38
PVC/general purpose($/lb.)	.32	.32	.32
PP/homopolymer($/lb.)	.36	.36	.37
PP/copolymer($/lb.)	.46	.46	.47
ABS($/lb.)	1.03	1.01	1.01
Unbleached kraft/shipping sack($/ton)	430	450	390
Unbleached kraft/grocery sack($/ton)	400		285
Linerboard, 42 lb. east($/ton)	350	350	260
Linerboard, 42 lb., west($/ton)	350	350	260
Corrugated med., semichemical($/ton)	320	320	245
Recycled folding boxboard, clay coated($/ton)	400	400	375
Recycled folding boxbd., chipbd.($/ton)	310	310	290
Bleached kraft, folding carton($/ton)	545	545	545

Source: Purchasing, a Cahners publication

PET CONTAINER DEMAND TO GROW 45% ANNUALLY

PET containers nearing "second burn"

PET container production for food, alcoholic beverages and personal care/medical products, currently estimated at 840 million units in 1986, will grow at an annual rate of 45 per cent, hitting 5.3 billion units by 1991.

According to Charles Minarik, vice president of marketing for Sewell Plastics Inc., Atlanta, one of PET's few obstacles to food container growth is barrier-enhancement demands of hot-filled products. "PET coated with PVDC is a near-term answer to barrier problems associated with some products," he said. "We believe post-coating for barrier is an interim step to barrier-enhanced PET."

PET's "second burn" into the food container market will include PET containers for coffee, peanut butter, salad dressings and juice drinks, among other products.

PACKAGING IMPORTANT TO NEW FOOD BUYS

Younger shoppers will shun unappealing packages

Food shoppers generally agree that packaging plays an important role in locating their supermarket purchase selections, according to a recent study conducted by The Berni Corp., Greenwich, Conn.

Study participants also tended to agree that they might try a new product because the packaging appealed to them. Younger consumers, aged 20 to 35, were stronger than other age groups on this issue.

Younger consumers also stated that they were significantly more likely to avoid trying a product because the packaging did not appeal to them. However, when it comes to purchasing products with regularity, consumers overall are not apt to buy it on packaging alone.

Further information on the Supermarket Attitude/Behavior Study is available from The Berni Corp., 666 Steamboat Road, Greenwich, Conn. 06830.

MORE STATS . . .

Negotiations in the folding carton industry in 1986 produced an average straight-time hourly increase of 2.6 per cent, or 26 cents an hour, according to a recent report published by the **Paperboard Packaging Council** . . . The **PPC** also reported a preliminary dollar volume for 1986's folding carton shipments at nearly $3.5 billion, 2.5 per cent higher than 1985 and an all-time record for the industry . . . Resin sales for blow-molded containers will increase an average of 5 per cent through 1990, according to "Blow Molding Update," published by **Business Communications Co Inc.**, Norwalk, Conn . . . Shipments of corrugated and solid fiber products in January were up 0.7 per cent over January 1986 and represent a record high for the month, the **Fibre Box Association** reported. January's containerboard consumption was 1.85 million tons.

SPECIAL REPORT

MACHINE SIMPLICITY TOPS USERS' WANTS

"Simplicity of changeover" wins big, over diagnostics, robotics, PACKAGING's own queries reveal

By R. Bruce Holmgren
Editorial Director

At world class packaging shows such as Pack Expo, the trend-setters get most of the attention—for example, robotics, advanced diagnostics, state-of-the-art electronics. The glare of publicity eludes a wide array of basic, functional, problem-solving machines of all types. In spite of the glamour and excitement surrounding the first group, it is the second and much larger group that makes the wheels go around for most of the packaging field.

Therefore, the results of PACKAGING's recent probing of machinery users hardly come as a surprise. Rather, they tend to confirm what many participants and observers of the packaging scene have long believed.

BUYERS EXPECT MACHINES TO LAST

Regardless of what packaging managers and financial executives say about how long it takes to justify any machine, our queries reveal that most users expect to keep a machine running a very long time.

A sampling of the comments received from many major USA firms suggests that those expecting a life of five years or less are in a minority.

Cited far more often is a life of 10 years or more, and a surprisingly high number expect machines to last 15 or more years.

SELECTION FACTORS: MIXED RATINGS BY SMALL, MEDIUM-SIZE AND LARGE PLANTS

Per cent rating each factor "extremely important"

Employees:	Less than 100	100 to 249	250 or more
Simplicity of changeover	48%	57%	48%
Ability to clean without disassembly	39	38	20
Price	39	24	12
Clean-up/changeover without tools	36	29	20
Ability to handle a wide range of materials/containers	29	24	24
Extra guarding for safety	25	29	12
Special or unusual space limitations	23	14	12
Diagnostic panel lights	16	19	16
Memory capability to recall control settings	16	19	20
Self-cleaning	16	9	8
Built-in programmable controllers	14	24	36
Maximum speed	14	24	36
Multi-purpose or monobloc machines	14	24	24
As open a construction as possible for accessibility	10	19	24
Diagnostic alpha-numeric, easy-to-read message displays	10	24	8
Vision systems/automatic inspection	9	5	16
Single-purpose machines	8	10	4
Automatic adjustment via computer	7	14	4
Automatic, computer-guided changeovers	7	10	8
Diagnostic flow chart or road map type of presentation	4	14	4

For example, are robotics and other forms of "high tech" winning widespread acceptance on today's packaging lines? They clearly are not, according to our survey.

As the accompanying charts show, we roughly calculated from the responses to our inquiries that only 4 per cent of small plants and about 28 per cent of the largest ones currently use robotics on any packaging machinery. Further, barely 7 per cent of small plants and 24 per cent of the large ones plan to buy any equipment with robotics over the next two years. Looking at the upbeat side of this, however, a fourth to nearly a third of plants we contacted are into or seriously moving toward robotics.

So much for all the talk about robotics which we have been hearing a lot about wherever packaging line managers and engineers meet. What about some of the other talked-of shifts to packaging-line improvements, such as inspection?

Inspection: which way?

This is another controversial area. On every side, regardless of product or package, reports tell us of the growing emphasis on consistent, even 100 per cent, inspection as a way of assuring the quality of what goes out. The question focuses on hand vs. automatic inspection, with due regard for the speed at which the inspection takes place. Even the largest plants, running at the highest speeds, do more hand inspecting than one might expect.

Of the latter, based on our pen-scratching, yellow-pad math, while 72 per cent are inspecting at 200 a minute or more, only 20 per cent currently use automatic inspection. We project (in other words, guess) that by 1989, this figure will jump only to 38 per cent.

Viewing the inspection issue from another perspective, we see that only 9 per cent of the small plants rate vision systems and automatic inspection as extremely important. For medium-size plants the figure drops below 5 per cent, and rises only to 16 per cent in large plants.

Diagnostics pro and con

Moving to another area of packaging operations, that of diagnostics, the picture is less clear. This is because of the varying levels of sophistication in the equipment and methods used with packaging-machine diagnostics. Just the same, the respondents positioned even the simplest of diagnostics no higher than 24 per cent, and with even lower rating on other features. For all practical purposes, diagnostics are near the bottom of the barrel.

All of the foregoing negative commentary to the contrary not withstanding, our inquiries among a number of users reveal that the responding companies spent a lot of money during 1986 and are doing likewise in 1987. Some 28 per cent of the largest respondents will spend in excess of $500,000 each.

As the chart shows, in all three breakdowns by plant size, some are spending more, some less, and others

When users plan new lines, such factors as "simplicity of changeover" claim top priority. Provision for advanced diagnostics or for robotics is way down.

Plants of large, national firms often stress simple machinery

the same in 1987 as in 1986. This raises the next question:

Machine decision factors

If those surveyed are not looking for robotics or "high tech" or are not stepping up their level of inspection sophistication, just what does interest them and just what are they buying or planning to buy?

We get our answers from a look at the factors they list as "extremely important." For all three size groups, "simplicity of changeover" ranked at the head of the list. "Ability to clean without disassembly" ranked second for the small and medium-size installations, with "clean-up and changeover without tools" and "ability to handle a wide range of materials or containers" not far behind.

From this the conclusion is inescapable that today's packaging lines must handle a range of product and package variations. It seems that the dedicated line is becoming an endangered species, except in a limited number of situations.

In this context, yet another aspect of the survey is its finding what proponents of long-range planning are in a minority. We show on our chart that about 14 per cent say they are planning five or more years ahead. In contrast, 20 to 43 per cent plan just one year ahead, while 29 to 37 per cent plan two years ahead.

Plant's choices—in context

While the charts provide a cross-section, they also are a generalized presention. To move from the generalities and the cumulative effect they offer, a look at a representative sampling of the survey responses reveals a different perspective.

The following paragraphs note the responses by particular plants, to let you evaluate both their actions and their plans in the context of a given industry or product spectrum.

Top speed—but no robotics

A Western plant of a major national food processor is spending $1 million or more on machinery during 1987. It is shifting fom 25 to 50 per cent automatic inspection.

It uses no robotics and does not plan to add any. It inspects at all speeds up to 300 or more a minute.

Factors it calls "extremely important" include maximum speed, simplicity of changeover—as well as a full array of diagnostics, automatic adjustment via computer, and memory capability to recall settings. Yet it is neutral on cleaning without disassembly, on open construction—and is in the middle on vision systems.

Have robotics, seek more

A well-known over-the-counter and ethical pharmaceutical products maker plans to spend half a million dollars at a plant employing over 1,000 people. It has robotics and plans to add more. Yet it is moving from 95 to 50 per cent human inspection, even though its inspection rates are from 100 to 300 per minute.

While it considers automatic, computer-guided changeovers "not important," it regards vision systems, memory capability to recall control settings, and diagnostic panel lights as "extremely important."

Automatic inspection up

A Northeastern plant of a large soap and toiletries manufacturer is spending $1 million or more this year, does have robotics and seeks more equipment using robotics. It has more than 250 employees, and while it inspects at speeds to 300 or more a minute, its percentage of automatic inspection will go from 10 to 40 per cent in two years. Of all the "extremely impor-

IN 1987, SOME ARE SPENDING MORE, OTHERS LESS

Will your 1987 packaging machinery expenditures be more, the same or less than your 1986 expenditures?

Employees:	Less than 100	100 to 249	250 or more
More than 1986	36%	29%	28%
The same as 1986	38	33	32
Less than 1986	22	38	40
No response	4	—	—

SOME FIRMS SPEND NOTHING, OTHERS $1 MILLION OR MORE

What was your total expenditure for packaging machinery in 1986? What do you anticipate your 1987 packaging machinery expenditures will be?

Employees:	Less than 100		100 to 249		250 or more	
	1986	1987	1986	1987	1986	1987
Nothing	21%	19%	—	—	4%	4%
Less than $10,000	32	19	5	5	4	4
$10,000 to $24,999	13	14	5	—	4	4
$25,000 to $49,999	12	21	—	14	12	12
$50,000 to $99,999	7	9	19	9	4	12
$100,000 to $499,999	10	13	43	47	44	48
$500,000 to $999,999	3	—	—	5	16	20
$1,000,000 or more	1	1	23	10	12	8
No response	1	4	5	10	—	—

MOST USERS DO NOT HAVE ROBOTICS, DO NOT PLAN TO ADD THEM

Do any of your packaging machines currently use robotics?

Employees:	Less than 100	100 to 249	250 or more
Yes	4%	5%	28%
No	96	95	72
No response	—	—	—

Do you plan to purchase equipment using robotics during the next two years?

Employees:	Less than 100	100 to 249	250 or more
Yes	7%	5%	24%
No	87	95	76
No response	6	—	—

MOST PLAN IN TERMS OF ONE, TWO OR THREE YEARS

How far in the future can you plan, allowing for improved, state-of-the-art packaging machinery?

Employees:	Less than 100	100 to 249	250 or more
Years	Per cent	Per cent	Per cent
1	21	43	21
2	29	33	38
3	27	5	25
4	10	5	4
5 or more	13	14	12

WITHIN TWO YEARS, AUTOMATIC INSPECTION WILL NEARLY DOUBLE

At what rate must you inspect?

Employees:	Less than 100	100 to 249	250 or more
Rate per minute	Per cent*	Per cent*	Per cent*
Less than 100 per minute	67	52	40
100 to 199	8	33	24
200 to 299	7	19	32
300 or more	3	19	40

*Percentages vary from 100 because of multiple responses

How much of this inspection currently is automatic vs. human? What will these percentages be two years from now?

Employees:	Less than 100		100 to 249		250 or more	
	Average percentages					
Type of inspection	1987	1989	1987	1989	1987	1989
Automatic	13	23	27	37	20	38
Human	87	77	73	63	80	62

Planners must provide for enough space for such tasks as manual inspection, (tables, benches, space) while everything is still in "early paper" stages.

tant" factors to choose from, it put only built-in programmable controllers in this category. On the other hand, its "not important" factors include vision systems, computer-guided changeovers and self-cleaning.

No robotics here

Even discounting the prospect that packaging and other managers similarly situated respond to our survey with varying depths of feeling, we find an interesting comparison of the preceding plant with one turning out more or less like products—in the Midwest. It has up to 249 employees and will spend up to half a million dollars this year.

It has no robotics and has no plans to acquire machinery that uses any. However, in two years it will go from 75 to 95 per cent automatic inspection. While it monitors individual lines, it favors controls that fit machines into a system.

Interestingly, it regards automatic adjustment by computer as very important but thinks that memory capability to recall control settings is almost not important. Otherwise, it listed the selection factors as either very important or approaching that degree of importance.

Human inspection up

A well-known cosmetics firm with between 250 and 500 employees at a particular plant in a central USA area will spend up to half a million dollars this year, has no robotics and does not plan to get any. Yet it seeks line controls that fit machines into systems and also allow independent operation.

In two years it will move from 95 to 98 per cent human inspection, and is more or less in the middle on diagnostics.

Another cosmetics producer, citing a plant in a different part of the country, has about the same number of employees as in the preceding example and apparently plans to spend about the same amount of money on new machinery during 1987. It, too, has no robotics and does not plan to add any.

However, in two years, it will raise its automatic inspection from 5 to 25 per cent, with its range of inspection remaining in the 200s per minute. Further, its "extremely important" list includes, along with simplicity of changeover (and factors relating to disassembly, accessibility, cleaning, et al) memory capability to recall settings, and with built-in PCs.

Ultimate sophistication

One of the Midwestern plants of a major nationally operating food processor has no more than 50 employees but plans to spend up to half a million dollars this year. It has no robotics but expects to acquire robotics-equipped machinery within two years. It has 90 per cent automatic inspection, at speeds of 300 a minute or higher.

It monitors its machines, entire lines and complete systems, and favors controls that provide comparable versatility. The only factors it called "not important" are simplicity of changeover and ability to handle a wide range.

On the other hand, it listed almost all of the other selection factors as "extremely important" with the exception of automatic adjustment by computer. This suggests a nearly all-out drive for ultimtae sophistication in a relatively small plant for a very large company. However, this plant's location in a rich crop-growing area suggests the company's need to provide peak output from more or less single-purpose plants. ■

R. BRUCE HOLMGREN
Editorial Director

"We are hearing that in spite of much attention on the latest state-of-the-art-advances and the electronic wizardry that are upgrading today's packaging machinery, companies large and small are buying the basics, such as simplicity and ease of use."

PLEASE RATE THIS ARTICLE

How would you rate this article? To reply, circle the appropriate number on the reader service card:

Outstanding	**452**
Above average	**453**
Average	**454**
Below Average	**455**

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/JUNE 1987

Consumers Rate New Packages

...PACKAGING's
3rd annual survey

Error-Free Packaging Line

Food Packers Test New Aluminum Can

Robots At IBM Pack Fragile Items

New Thrust For Barrier Plastics

Innovations From Japan

KRAFT
NEW!
NEW!
SQUEEZABLE!
ZESTY
ITALIAN
DRESSING
12 FL.OZS (355ml)
50%

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INDUSTRIAL PACKAGING TO GROW 6.4% ANNUALLY

Film wrap will grow fastest among industrial materials

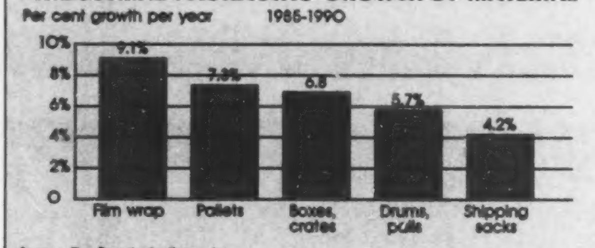
U.S. industrial packaging shipments are projected to increase 6.4% annually and will exceed $27 billion in sales by 1990, according to a recent study published by The Freedonia Group Inc., Cleveland.

Fiber boxes will continue to dominate primary packaging with shipments of nearly $16 billion in 1990, primarily due to expanding applications to growing markets such as consumer electronics.

The fastest growing industrial packaging material will be plastic film wrap, projected to increase 9% per year to total 1.7 billion pounds by 1990 as it continues to replace traditional strapping applications. Wood pallets will continue to dominate load unitizing products. Replacement of diposable wood pallets by fibreboard slip sheets will be somewhat deterred by high converting costs.

For more information on the report, contact The Freedonia Group, 2940 Noble Road, Cleveland, Ohio 44121.

INDUSTRIAL PACKAGING GROWTH BY MATERIAL



Source: The Freedonia Group Inc.

PET containers are forecast for increased growth between 1989 and 1991.

MICROWAVE PACKAGING TO HIT $340 MILLION

Shifting demographics will drive growth

Sales of advanced microwavable packaging for prepared foods will reach 2.2 billion units, or $340 million in sales by 1991, according to a new study published by C.H. Kline & Co., Fairfield, N.J.

According to the study, nearly 60% of these sales will be for entrees and dinners with popcorn and pizza combining for an additional 27%.

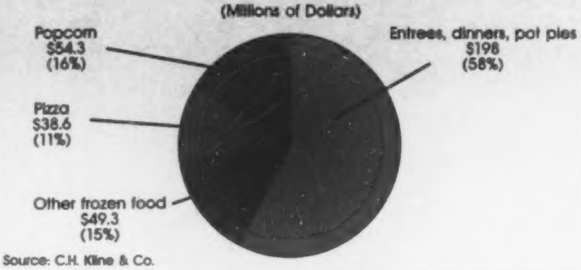
Shifting consumer lifestyles and the emergence of more women in the workplace are the primary forces behind the nearly 70% annual rate of growth forecast for microwavable packaging through 1991. By that time, 80% of U.S. households will own a microwave oven, the report predicts.

Two major types of advanced packages will grow in use, according to the study. Susceptors, or metallized films laminated to paper or plastic carriers, will provide localized heating or browning in such products as popcorn or pizza. Guidance foil systems, or selective channeling of microwave energy through packaging, will emerge in such applications as trays for frozen dinners where, combined with susceptors, entrees can brown and cook while the dessert stays cool.

For further information on *Advanced Microwavable Packaging*, contact C.H. Kline & Co., Inc., 330 Passaic Ave., Fairfield, N.J. 07006.

MICROWAVABLE PACKAGE SALES BY PRODUCT, 1991

(Millions of Dollars)



Source: C.H. Kline & Co.

PACKAGING LEADTIMES (in weeks)

	Apr. '87	Mar. '86	Apr. '86
Metal cans	3.3	3.4	3.0
Composite cans	3.2	3.4	3.4
Glass containers	3.8	4.1	4.8
Plastic bottles	3.8	4.1	4.8
Plastic film	3.8	4.0	3.6
Laminates	4.3	4.5	4.8
Corrugated containers	3.2	2.9	2.9
Multiwall bags	3.8	4.7	3.7
Kraft paper	3.4	3.5	3.1
Folding cartons	3.7	4.2	3.2
Fiber drums	3.2	3.1	3.4
Industrial crates	3.2	2.9	3.2
Strapping	3.2	2.6	2.7
Steel drums (shipping)	3.2	3.0	3.3
Pallets	2.5	2.6	2.9

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES

	Apr. '87	Mar. '86	Apr. '86
Aluminum can stock ($/lb.)	1.00	1.00	1.05
LDPE/liner($/lb.)	.31	.28	.30
LDPE/clarity($/lb.)	.35	.33	.35
LLDPE/butene($/lb.)	.30	.28	.30
LLDPE/octene($/lb.)	.36	.34	.34
HDPE/blow molding($/lb.)	.36	.32	.33
HDPE/film grade($/lb.)	.35	.35	.36
Polystyrene/general purpose($/lb.)	.46	.40	.32
Polystyrene/impact($/lb.)	.49	.43	.35
PVC/general purpose($/lb.)	.33	.32	.31
PP/homopolymer($/lb.)	.38	.36	.36
PP/copolymer($/lb.)	.48	.46	.46
ABS($/lb.)	1.06	1.03	.98
Unbleached kraft/shipping sack($/ton)	460	460	405
Unbleached kraft/grocery sack($/ton)	400	400	300
Linerboard, 42 lb. east($/ton)	350	350	260
Linerboard, 42 lb., west($/ton)	350	350	275
Corrugated med., semichemical($/ton)	320	320	255
Recycled folding boxboard, clay coated($/ton)	400	400	375
Recycled folding boxbd., chipbd.($/ton)	310	310	290
Bleached kraft, folding carton($/ton)	600	600	565

Source: Purchasing, a Cahners publication

PLASTIC TO CONTINUE REPLACING METAL CANS

Metal's extinction far from likely, report says

Replacement of metal cans by plastic containers for food and general packaging categories will grow from 1.2 billion units in 1985 to about 4.3 billion units in 1995, according to a recent study by Omega Research Associates Inc., Pittsburgh.

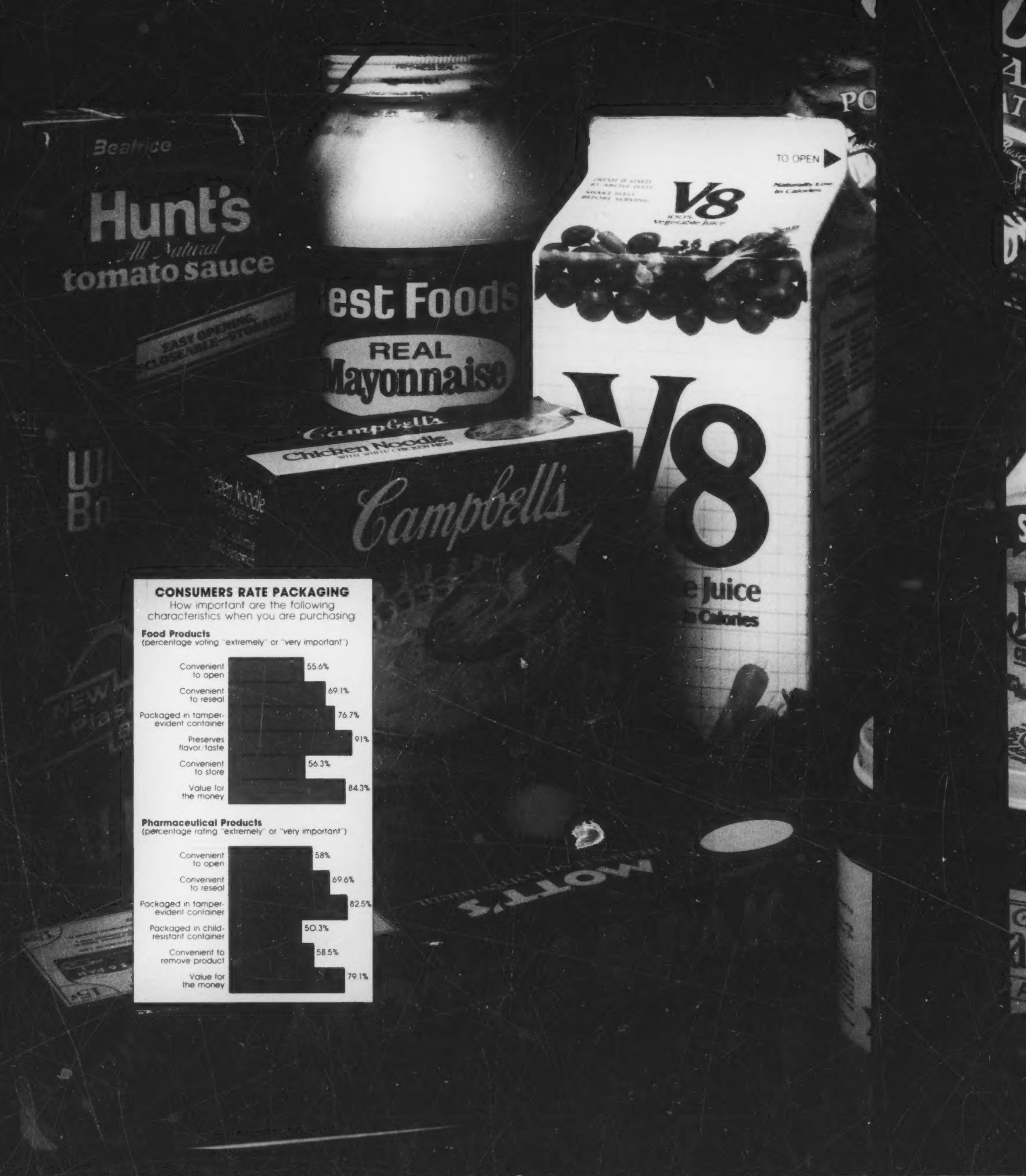
According to *Metal Cans and the Impact of Plastic Replacements*, most canned food products will decline in popularity over the next 10 years, although a few categories such as such as canned seafood will show modest increases. The No.10 can will give ground to new improved flexible packaging structures suitable for hot-fill and retorting.

The potential for metal can replacement by plastics is greatest in general packaging, including aerosols and rigid containers for paints, coatings and other nonfood products. Metal can replacement by plastic in this category was nearly 1 billion units in 1985 and might reach 2.8 billion units in 1995.

For further information, contact Omega Research Associates Inc., 5907 Penn Ave., Suite 215, Pittsburgh, Pa. 15206.

MORE STATS . . .

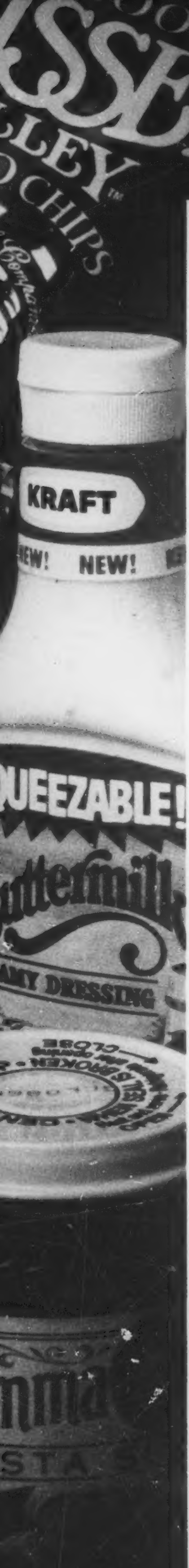
Folding carton shipments for February reached a dollar volume of $283.4 million, up 2.5% over last year, the **Paperboard Packaging Council** reported . . . The **Fibre Box Association** continues to report record shipments of corrugated and solid fiber products. February's figure of 22.7 billion square feet shipped represents a new record for that month. Year-to-date industry shipments are 2.6% ahead of last year's record pace . . . The Consumer Packaged Goods Index from **Cahners Economics**, which tracks output of major manufacturers, is predicted to grow slightly slower than last year's 4.1% gain to finish at 3.6%.



CONSUMERS RATE PACKAGING

How important are the following characteristics when you are purchasing:

Food Products
(percentage voting "extremely" or "very important")
Convenient to open 55.6%
Convenient to reseal 69.1%
Packaged in tamper-evident container 76.7%
Preserves flavor/taste 91%
Convenient to store 56.3%
Value for the money 84.3%
Pharmaceutical Products
(percentage rating "extremely" or "very important")
Convenient to open 58%
Convenient to reseal 69.6%
Packaged in tamper-evident container 82.5%
Packaged in child-resistant container 50.3%
Convenient to remove product 58.5%
Value for the money 79.1%
Beatrice
Hunt's
All Natural
tomato sauce
EASY OPENING RECLOSEABLE—STORABLE
Best Foods
REAL Mayonnaise
Campbell's
Chicken Noodle
Campbell's
V8
100% Vegetable Juice
TO OPEN
Vegetable Juice
Naturally Low in Calories
MOTT'S



SPECIAL REPORT

CONSUMER SURVEY REVEALS SURPRISES

Do consumers like squeezable containers for food products? If a food package is microwavable, how often does this influence consumers to buy the product? Do consumers feel that manufacturers of food and pharmaceutical products are doing enough with packaging to protect them from tampering? Do consumers check for codes or expiration dates on packages?

These are but four of 38 questions asked of 1,000 consumers nationwide as part of PACKAGING's third annual Consumer Survey, conducted for PACKAGING by NFO Research Inc., Chicago. Consumer households were selected based on U.S. Census data on geographic divisions, market size within each division, age of female householder, annual household income and household size. NFO conducted the survey earlier this year and tabulated the results based on a return exceeding 72%.

This article presents the answers to the above packaging questions plus a host of others. Some of them may surprise you.

Consumers clearly rate packaging characteristics as extremely or very important when purchasing products.

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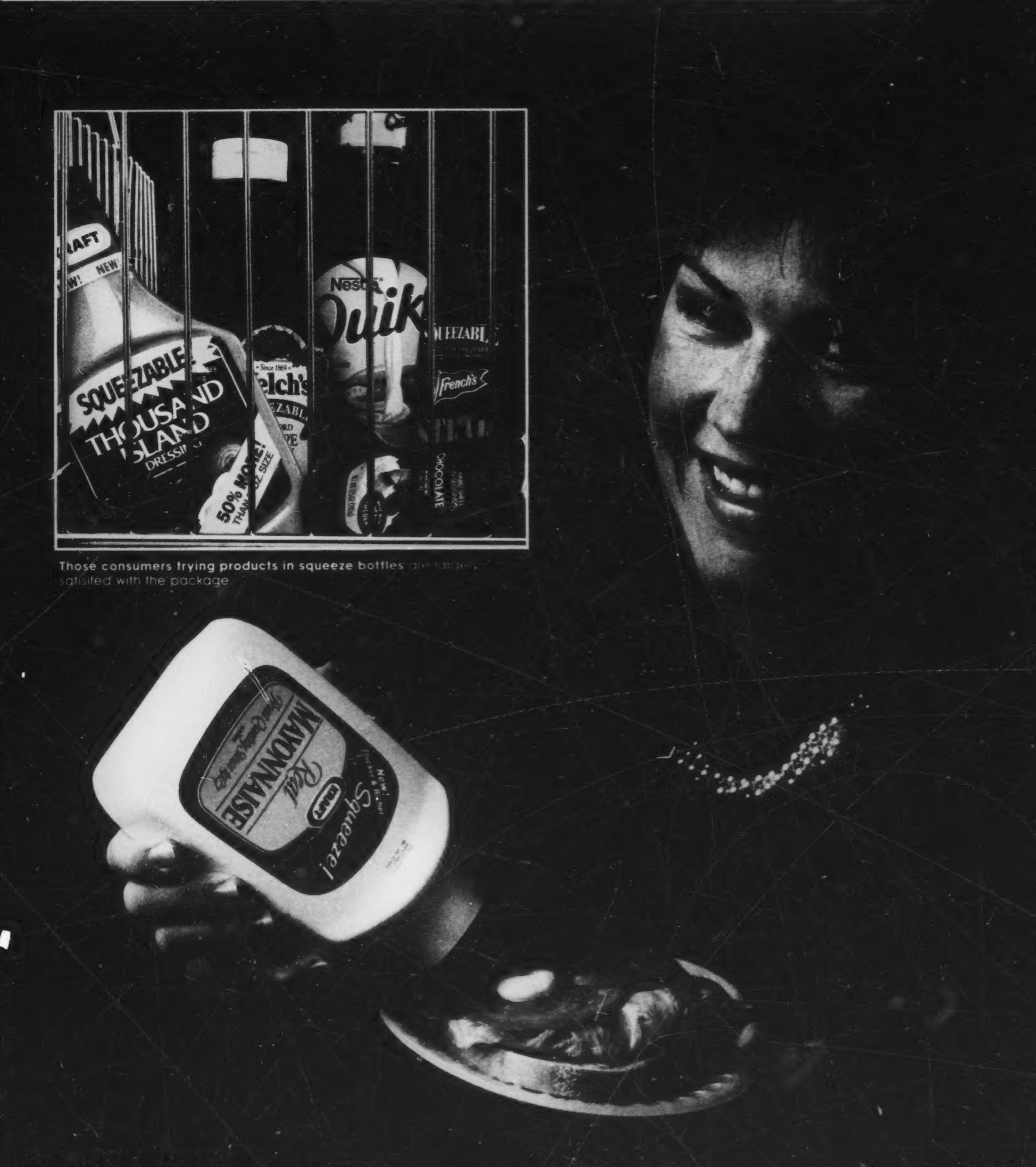
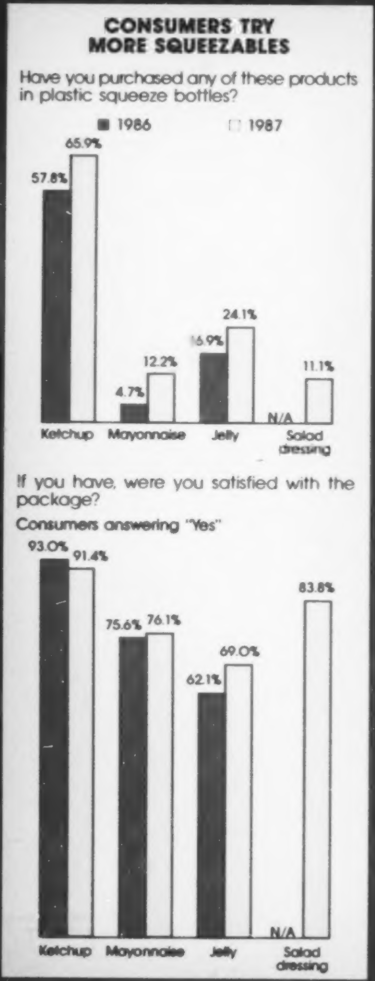
ND SPIC

47

6


KRAFT
NEW! NEW!
SQUEEZABLE
THOUSAND ISLAND DRESSING
50% MORE! THAN OZ. SIZE
Since 1869
Welch's
SQUEEZABLE
Nestlé Quik
SQUEEZABLE
French's
CHOCOLATE
Real MAYONNAISE
KRAFT
New!
Squeeze!

Those consumers trying products in squeeze bottles are largely satisited with the package



CONSUMERS TRY MORE SQUEEZABLES

91.4% of squeezable ketchup users were satisfied with the package

Clearly, consumers are very aware of the role of packaging when making food and pharmaceutical purchases. The most important characteristic for a food package is that it preserves the product's flavor and taste; 91% of the respondents rated this as extremely or very important. Following were "value for the money" at 84.3%, "packaged in a tamper-evident container" at 76.7% and "convenient to reseal"at 69.1%.

For pharmaceutical products, increased consumer awareness of tamper evidence was reflected in this year's survey. "Packaged in a tamper-evident container" topped the list of extremely or very important package characteristics by 82.5% of the survey, followed by "value for the money" at 79.1%.

Squeezing on the rise

Among the highlights of 1986 and early 1987 is the introduction of more and more food products in plastic squeeze bottles. Some of the more exotic have included pickle relishes, dessert toppings and steak sauces. Whatever the product, consumers appear willing to keep giving squeeze bottles a try.

Compared to last year, the number of consumers saying they've tried ketchup in a squeeze bottle grew from 57.8% to 65.9%. Those trying squeeze mayonnaise and jelly also grew, from 4.7% to 12.2% and from 16.9% to 24.1%, respectively. Salad dressing, not included in last year's survey, was tried by 11.1% of those surveyed.

Trying usually leads to liking. When asked if they were satisfied with the squeeze bottle, 91.4% of the ketchup users said yes along with 76.1% of the mayonnaise users, 69% of the jelly users and 83.8% of salad dressing squeezers.

Traditional packaging options should not be abandoned entirely, however. Last year's response to the question, "If you have not purchased any of the above products in a plastic squeeze container, why not?" the largest response from the entire survey was "Haven't seen them" at 28.6%. This year, where only those who had not tried squeeze bottles responded, that answer was indicated by 21.2% of the survey, which placed third behind "I like glass better" at 44.3% and "They are expensive" at 37.9%.

In light of traditional vs. non-traditional packages, consumers were evenly divided over the idea of shelf-stable entrees. Phrased "If a new packaging process were developed that permitted beef stew or turkey dinners to be sold on the supermarket shelf, not frozen or refrigerated but in a plastic container/carton, how likely would you be to try this new product?" 35.9% answered they probably or definitely would try it, 29.1% said they might or might not try it and 33.8% said they probably or definitely would not try it.

Are young people more receptive to such new products than older people? Examining the demographics on this question reveals little bias regarding age or the presence of children. Among those likely to try new shelf-stable entrees, young singles and older singles registered 4.6% and 8.1% of the total while young parents and older parents registered 11.6% and 17%, respectively.

The same balance holds true on the other side of the question. Among those not willing to try the new entrees, young and older singles were a respective 4.5% and 13.1% of their total while young and older parents represented 12.3% and 13.1%.

Another recent packaging development is the retortable plastic container. Responding

76.4% said that microwavable packages influence their decision to buy the product, at least sometimes

to "There are several food products packaged in new plastic cans (soup, spaghetti, etc.) Would you like to see more items packaged this way?" 19.1% said yes, 8.6% said no and 69.3% said they were not familiar with such products.

The microwave factor

Depending on which study you read, the microwave oven resides in nearly, about or slightly more than 50 per cent of American households. Using a microwave oven, however, extends beyond the home as the appliances are becoming more familiar sights in convenience stores, offices, cafeterias and other outlets.

Correspondingly, microwave oven use is up in this year's survey; 73.5% of respondents reported using a microwave oven compared to 65.2% last year. "Use" ties strongly to "own" as 95.5% of those who reported using a microwave oven also own one.

Among age groups, who uses the microwave most? Children in the household seems to be a telling factor. Young singles, middle singles and older singles reporting microwave oven use were 4.5%, 8.3% and 6.2%, respectively, of the 73.5% total. Young parents, middle parents and older parents tallied 14%, 15.7% and 16.2%, respectively.

Micro Magic
SWANSON
FOR MICROWAVE OVENS, TOO!
baked perfect
new
Pillsbury
Microwave
POPCORN
BUTTER
IMPROVED PACKAGING POPS BETTER!
Microwave CLASSIC CASSEROLES
SWANSON
scrambled eggs & sausage with hashed brown potatoes
THE GOURMET
SIRLOIN SALISBURY STEAK DINNER
Stokely's Singles
Sweet Peas in Butter Sauce
New!

Microwavable packaging is exerting a growing influence on consumers to purchase microwavable food products.

Whether the microwave is used at home or away, package microwavability is exerting a growing purchasing influence on consumers, at least on an occasional basis.

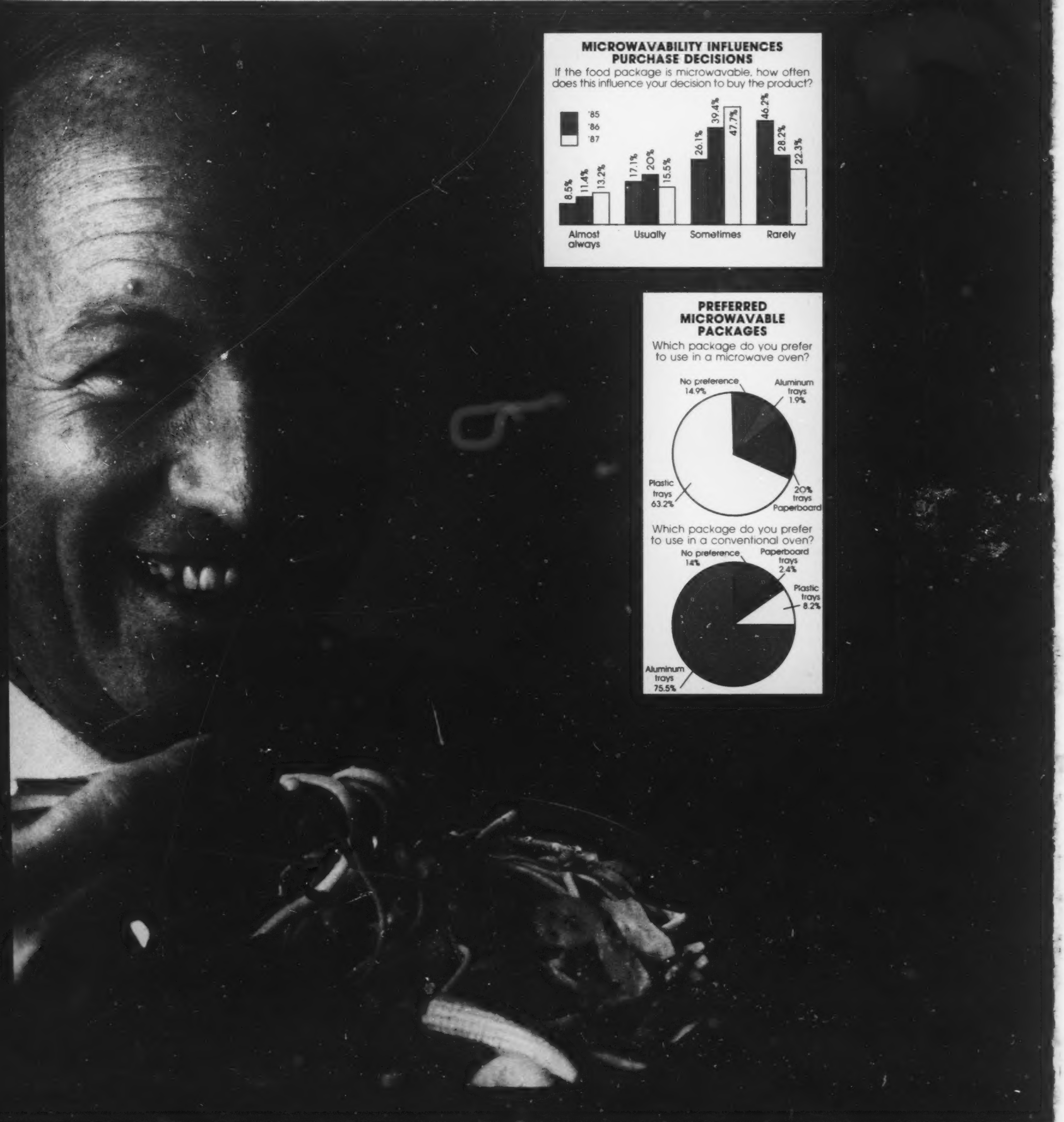
In response to the question, "If the food package is microwavable, how often does this influence your decision to buy the product?" 13.2% answered "almost always," up from 11.4% last year; 15.5% answered "usually," down from 20.0% last year; and "sometimes" garnered 47.7%, up from 39.4% in 1986. Those answering "rarely" dropped from 46.2% in 1985 to 22.3% this year.

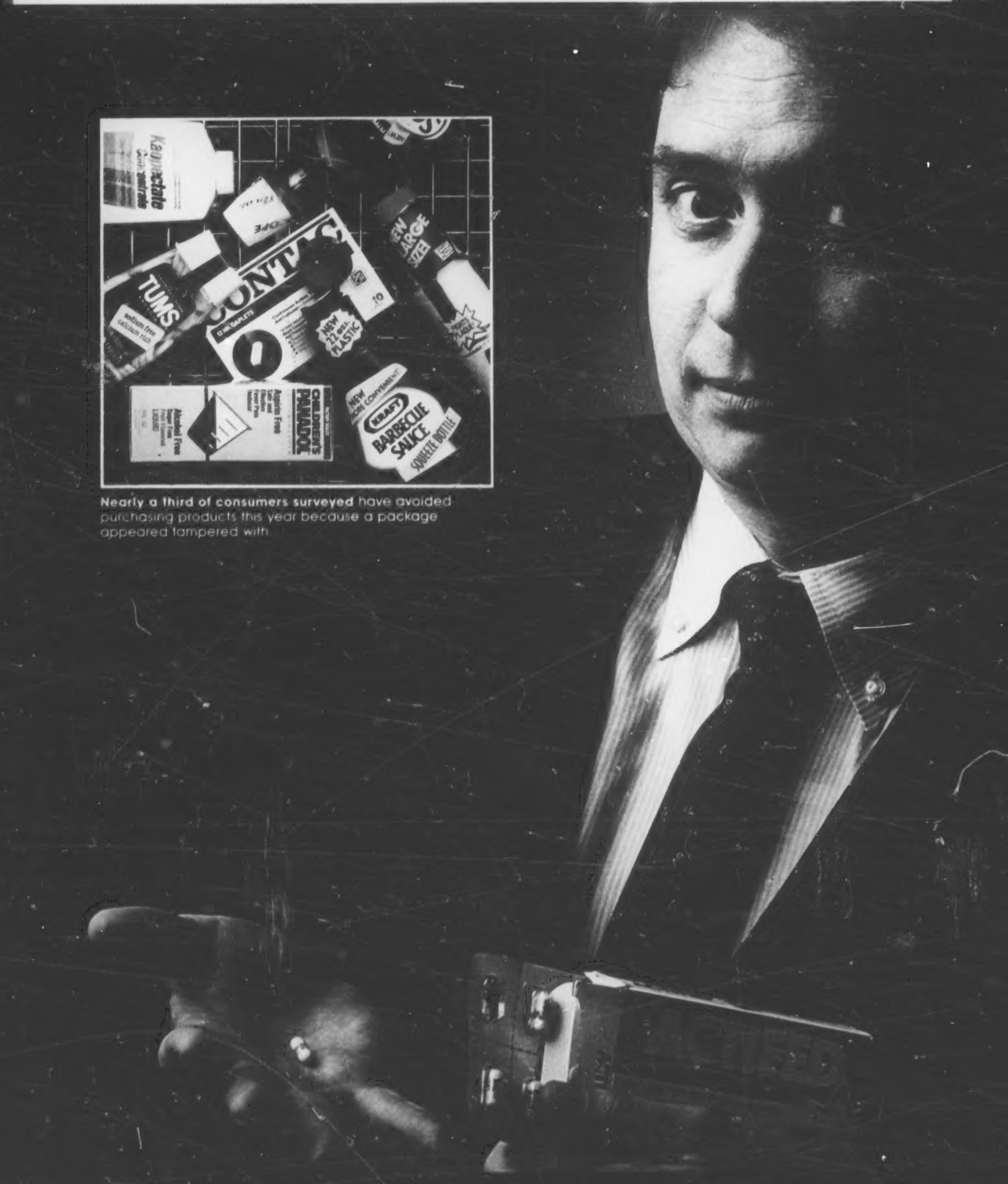
Food package preferences differ radically depending on how the item will be cooked. Plastic trays are the package of choice for microwave ovens, preferred by 63.2% of microwave oven users followed by paperboard trays at 20%, aluminum trays at 1.9% and 14.9% expressing no preference. However, when asked for the package they preferred to use in a conventional oven, consumers strongly endorsed the aluminum tray at 75.5% of the total survey with plastic trays trailing at 8.2% followed by paperboard trays at 2.4%.

Label likes and dislikes

Where do consumers feel food labeling is doing a good job vs. areas where it could stand improvement? In respect to listing of ingredients and directions of product preparation, 82.9% and 78.9% of consumers, respectively, rated food labels as excellent or good in these areas compared to 14.4% and 17.9% who rated them fair or poor.

However, regarding accuracy of the product photograph in relation to the actual


MICROWAVABILITY INFLUENCES PURCHASE DECISIONS
If the food package is microwavable, how often does this influence your decision to buy the product?
'85
'86
'87
8.5%
11.4%
13.2%
17.1%
20%
15.5%
26.1%
39.4%
47.7%
46.2%
28.2%
22.3%
Almost always
Usually
Sometimes
Rarely
PREFERRED MICROWAVABLE PACKAGES
Which package do you prefer to use in a microwave oven?
No preference 14.9%
Aluminum trays 1.9%
20% trays Paperboard
Plastic trays 63.2%
Which package do you prefer to use in a conventional oven?
No preference 14%
Paperboard trays 2.4%
Plastic trays 8.2%
Aluminum trays 75.5%

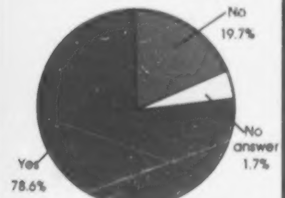


Kaopectate Concentrate
TUMS
sodium free calcium rich
CONTAC
NEW 22 OZ. PLASTIC
NEW LARGE SIZE
CHILDREN'S PANADOL
Aspirin Free
Alcohol Free
NEW MORE CONVENIENT
KRAFT
BARBECUE SAUCE
SQUEEZE BOTTLE

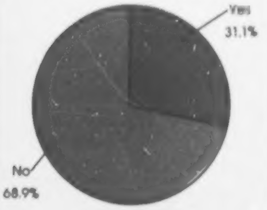
Nearly a third of consumers surveyed have avoided purchasing products this year because a package appeared tampered with.

CONSUMERS CHECK FOR TAMPERING

When you last purchased a pharmaceutical or food product, did you check for evidence of tampering?



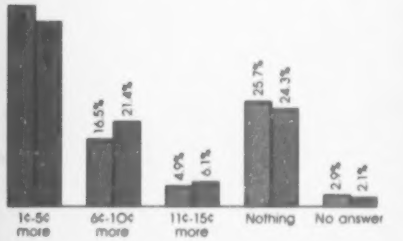
During the past six months did you avoid purchasing pharmaceutical or food products because the package appeared having been tampered with?



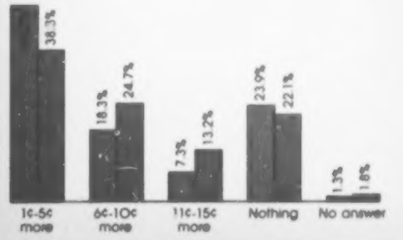
HOW MUCH WILL CONSUMERS PAY FOR TAMPER EVIDENCE?

▨ 1986
▨ 1987

Food
How much more, if anything, would you be willing to pay for a food product in tamper-evident packaging vs. the same product without it?



Pharmaceutical
How much more if anything, would you be willing to pay for a pharmaceutical product in tamper-evident packaging vs. the same product without it?



> **78.6% of consumers reported checking purchases for signs of tampering**

product and providing information about the purpose of additives, consumers were less approving. Approximately 53% rated food labels as only fair or poor regarding prouct photo accuracy compared to 42.9% rating them excellent or good; 50.5% rated labels as fair or poor on providing information on the purpose of additives while 45.8% rated them excellent or good.

Tamper awareness grows

Reports of tampered products across the country rose from an estimated 128 in 1985 to an alarming 1,600 and above last year, prompting FDA commissioner Frank Young to label 1986 a "year of crisis."

That statistic has not been lost on the American consumer. When asked if they checked for evidence of tampering on food and pharmaceutical purchases, 78.6% responded yes, 19.7% said no and 1.7% didn't answer.

Those checking are relatively balanced across the lifestage spectrum. Young singles, middle singles and older singles reporting yes were were 4.9%, 10.8% and 9.2%, respectively, of the total. Young couples, working older couples and retired older couples who checked were 7.1%, 12.5% and 12.3% of the total while young parents, middle parents and older parents came in slightly higher at a respective 14.1%, 13.2% and 15.2%. All ages and lifestyles, it seems, are growing in tamper awareness.

And suspicious-looking packages are likely to be avoided by consumers. Nearly a third of the survey (31.1%) reported not purchasing a food or pharmaceutical product recently because the package appeared tampered with.

Will consumers pay more for over-the-counter drugs in tamper-evident packages vs. the same products without? While 22.1% said no, 38.3% said yes to 1 cent to 5 cents more, 24.7% would pay from 6 cents to 10 cents more and 13.2% would pay from 11 cents to 15 cents more.

The answers are roughly the same for food products. Approximately 24.3% of consumers surveyed would pay no more for food in tamper-evident packaging while 46.2% would pay 1 cent to 5 cents more, 21.4% would pay 6 cents to 10 cents more and 6.1% would pay 11 cents to 15 cents difference.

Consumers also are eager to see more food products in tamper-evident packaging. In response to the question, "Which of the following types of foods do you feel should be packaged in tamper-evident packaging?" 75.2% said candy, 73.5% said cottage cheese, the same amount indicated cereals, 71.3% said meat, 70.3% said peanut butter and 69.1% said cheese. The list also included potato chips, spices, yogurt and pet food, which garnered a 42.7% response.

In light of these figures, should manufacturers of food and pharmaceutical products be doing more regarding tamper-evident packaging? Somewhat surprisingly, 68.7% of the survey felt food and pharmaceutical producers were doing enough with their packaging to protect them from a tampered product; 27.7% thought otherwise.

Freshness is important

Along with checking for tampering, consumers pay close attention to expiration date marking as well. When asked, "Before purchasing products, do you look for a code/expiration date on the package?" 86.5% responded yes and only 12.1% said no. Correspondingly, 91.5% of the survey felt that freshness of their food purchases was extremely or very important to them. Consumers are ap-

Glass jars received a 4.3 on a scale of 1 to 5 for preserving flavor and taste

General Mills
WHEATIES
BREAKFAST OF
Hunt's
NATURAL
ITALIAN
COLD SYRUP
NEW Plastic Bottle

parently satisfied with packaging's performance where protecting freshness is concerned as 67% said they discard packaged food products because they lose freshness only once a month or less.

Rating the containers

On a scale of 1 to 5, with 1 being poor and 5 being excellent, consumers were asked to rate food and pharmaceutical containers for a variety of characteristics.

Taken separately, the food containers included the squeeze bottle, glass jar, metal can, snack pouch, carton with inner bag and plastic jar. The characteristics to be measured were convenient to open, convenient to reseal, packaged in a tamper-evident container, preserves flavor and taste, convenient to store and value for the money.

While there were no perfect 5s, the glass jar garnered the highest mean score of 4.4 for convenience of resealing along with the squeeze bottle and the plastic jar which received marks of 4.3 and 4.1 respectively. The glass jar scored highest for preserving flavor and taste with a 4.3, followed by the plastic squeeze bottle with a 3.7 and the plastic jar at 3.6. The tamper-evidence title went to the metal can with a 4.3, which was also the consumers' pick for best value for the money at 3.9 followed closely by the glass jar at 3.7

The results for pharmaceutical containers were just as interesting. The containers were blister packs, a bottle with a neck-band seal, a bottle with an inner seal, a bottle with a child-resistant cap, a carton with a printed overwrap and a bottle contained in a canister with a pull ring. The characteristics for rating them were convenient to open, convenient to reseal, packaged in a tamper-evident container, packaged in a child-resistant container, convenient to remove product and value for the money.

Not surprisingly, considering the increased number of tamper-evident packages among pharmaceutical products, none of the containers were rated as particularly easy to open or reseal. The shrink-sleeve neck band and the bottle-in-a-canister tied for the highest rating for tamper evidence at 4.1, followed closely by the bottle with the inner seal with a 4.0 mark.

Also, none of the containers were rated as particularly excellent or very poor values for the money. The highest mark was a 3.6 for the bottle with an inner seal, but none of the other containers scored below a 3.1

Recycling interest high

Asked the question, "How important is recycling to you?" nearly 82% of consumers answered either extremely or somewhat important.

Taking the point further, the question was asked "Would you be willing to separate such items as glass, cans and paper from household trash so that they could be collected separately?" The number of consumers anwering yes rose to 82% this year compared to 76.2% last year while the number of those saying no dropped from 22.8% in 1986 to 16.4%.

Recyclability of the package is a growing factor in purchasing decisions compared to last year. Responding to "How often does the recyclability of a package affect your decision to buy one product over another?" 41.3% of consumers answered often or sometimes this year compared to 36.2% last year. Correspondingly, those saying seldom or never dropped from 63.9% last year to 57.2% this year. ■

FOR FURTHER INFORMATION

Information contained in this article was condensed from more than 250 pages of tables and other information. The complete study contains in-depth consumer response information to 38 packaging-related questions and is available for $175 by contacting Consumer Survey Editor, PACKAGING, 1350 E. Touhy Ave., Des Plaines, Ill. 60018. For more information, circle **463** on the Reader Service Card.

RAY CHALMERS
Associate Editor

"Consumer opinion on packaging is growing more sophisticated and it deserves close attention. No longer do consumers take packaging for granted."

PLEASE RATE THIS ARTICLE

How would you rate this article? To reply, circle the appropriate number on the Reader Service Card:

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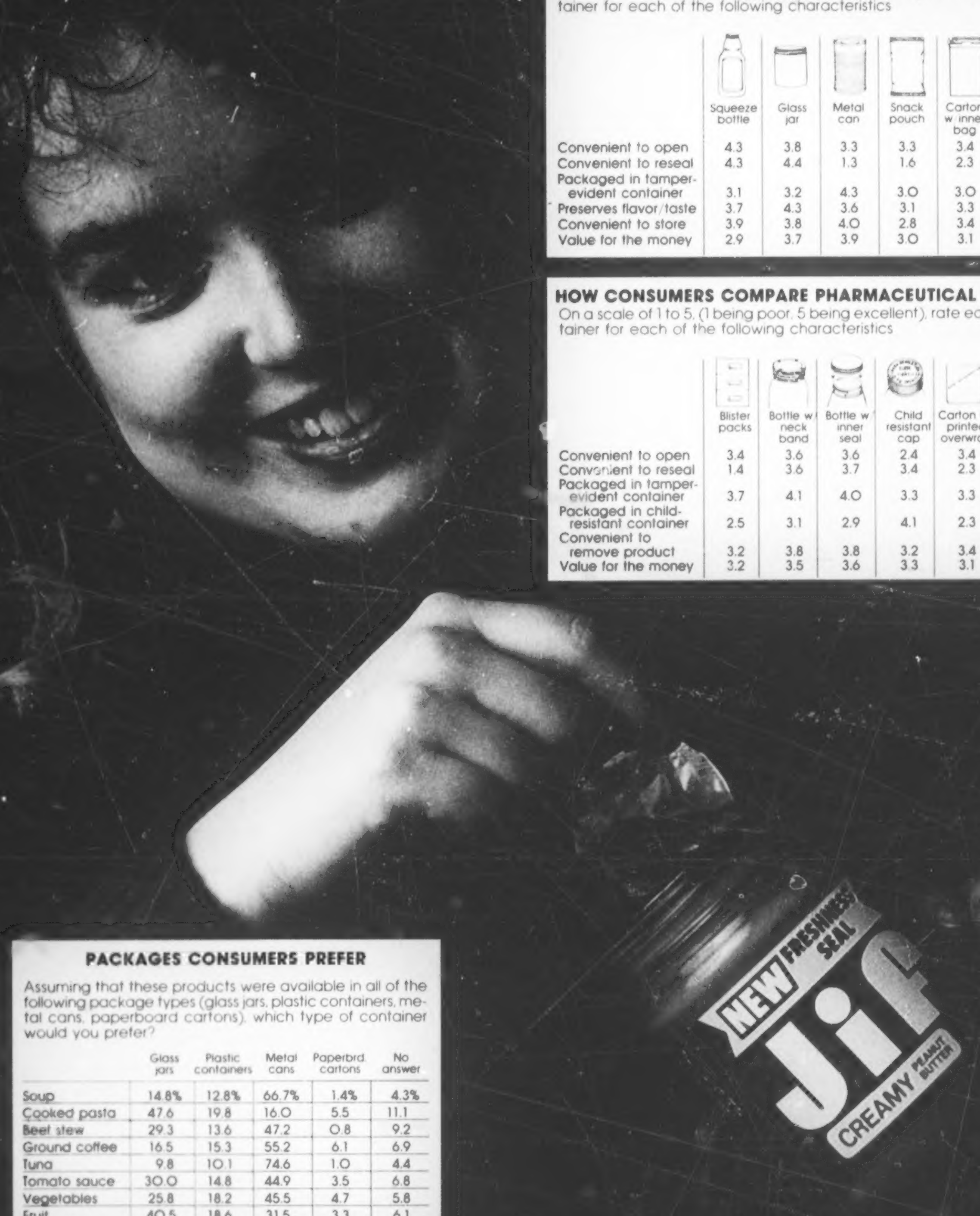

HOW CONSUMERS COMPARE FOOD PACKAGES

On a scale of 1 to 5, (1 being poor, 5 being excellent), rate each food container for each of the following characteristics

	Squeeze bottle	Glass jar	Metal can	Snack pouch	Carton w/ inner bag	Plastic jar
Convenient to open	4.3	3.8	3.3	3.3	3.4	3.9
Convenient to reseal	4.3	4.4	1.3	1.6	2.3	4.1
Packaged in tamper-evident container	3.1	3.2	4.3	3.0	3.0	3.1
Preserves flavor/taste	3.7	4.3	3.6	3.1	3.3	3.6
Convenient to store	3.9	3.8	4.0	2.8	3.4	3.7
Value for the money	2.9	3.7	3.9	3.0	3.1	3.3

HOW CONSUMERS COMPARE PHARMACEUTICAL PACKAGES

On a scale of 1 to 5, (1 being poor, 5 being excellent), rate each food container for each of the following characteristics

	Blister packs	Bottle w/ neck band	Bottle w/ inner seal	Child resistant cap	Carton w/ printed overwrap	Can w/ pull ring
Convenient to open	3.4	3.6	3.6	2.4	3.4	3.8
Convenient to reseal	1.4	3.6	3.7	3.4	2.3	2.3
Packaged in tamper-evident container	3.7	4.1	4.0	3.3	3.3	4.1
Packaged in child-resistant container	2.5	3.1	2.9	4.1	2.3	2.9
Convenient to remove product	3.2	3.8	3.8	3.2	3.4	3.6
Value for the money	3.2	3.5	3.6	3.3	3.1	3.1

PACKAGES CONSUMERS PREFER

Assuming that these products were available in all of the following package types (glass jars, plastic containers, metal cans, paperboard cartons), which type of container would you prefer?

	Glass jars	Plastic containers	Metal cans	Paperbrd. cartons	No answer
Soup	14.8%	12.8%	66.7%	1.4%	4.3%
Cooked pasta	47.6	19.8	16.0	5.5	11.1
Beef stew	29.3	13.6	47.2	0.8	9.2
Ground coffee	16.5	15.3	55.2	6.1	6.9
Tuna	9.8	10.1	74.6	1.0	4.4
Tomato sauce	30.0	14.8	44.9	3.5	6.8
Vegetables	25.8	18.2	45.5	4.7	5.8
Fruit	40.5	18.6	31.5	3.3	6.1
Soft drinks	34.3	28.0	30.5	2.1	5.1
Beer	39.5	7.2	34.1	1.0	18.2
Wine	68.9	7.9	4.0	1.5	17.6

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7/14/87

PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/JULY 1987

GLASS: The Hot New Package

Top 50 'Giants' In Packaging

Recycling Saves $500,000 A Year

How To Reduce Pouch Problems

New Packages For Microwaving

Nut Co. Improves Vacuum Packing

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VOLUME 32 NUMBER 9

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KRAFT BOARD USAGE TO GROW THROUGH 1988

Decline of dollar to keep exports strong

Containerboard consumption in the United States will increase by about 2.5 per cent in 1987 and by slightly less than that in 1988, according to a report by International Paper Co. The decline of the dollar should keep exports fairly strong.

The operating rate for linerboard in 1987 is likely to remain in the middle to high 90s, the report said.

Little new capacity is coming on elsewhere in the world. Most of that is a result of additions to existing machines.

SHIPMENTS OF CANS FOR SOFT DRINKS, BEER RISE

Profitability seen as one major factor

Metal cans for soft drinks and beer maintained their record of per centage increases in shipments throughout 1986 according to the Can Manufacturers Institute, Washington, D.C.

Soft-drink can shipments grew 6.6 per cent to 36.8 billion units, pushing their share of total soft-drink gallonage above the 40 per cent mark for the first time. Total shipments of beer cans grew by 1.2 per cent to 36.1 billion units during the year, bringing the can share of total beer barrelage to 70 per cent.

Michael Dunn, president of the Can Manufacturers Institute, credited seven key factors: bottler profitability, growth in vending, multipacking, retailer profitability, consumer demand, packaging quality, and recyclability.

Dunn said, "Metal cans continue to be, by far, the soft-drink and beer industry's most profitable package. They're outperforming glass and plastic bottles in every arena—production, distribution, and margin contribution."

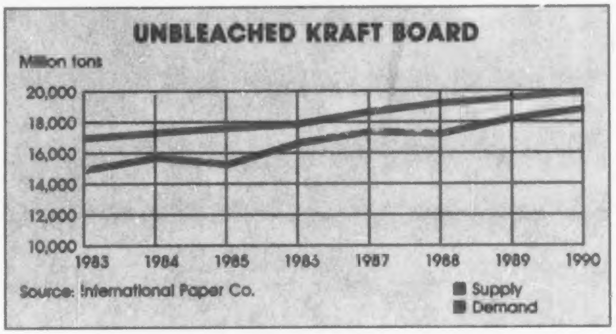
AEROSOL PRODUCTION RISES FOR FOURTH YEAR

Personal products remain largest category

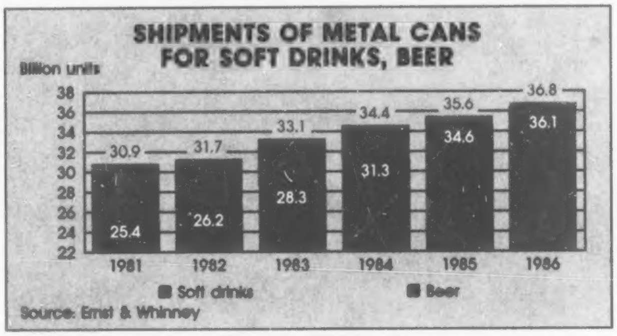
Aerosol production rose by 5 per cent in 1986—the fourth consecutive year in which the industry has seen real growth in units.

According to recent estimates by the Chemical Specialties Manufacturers Association, slightly more than 2.5 billion aerosol container units were filled in 1985 and more than 2.6 billion were filled last year.

Personal products remain the largest category of aerosols, the survey noted, accounting for more than 36 per cent of total containers filled.



Source: International Paper Co.



Source: Ernst & Whinney

PACKAGING LEADTIMES (in weeks)

	May. '87	April '87	May '86
Metal cans	3.8	3.3	3.3
Composite cans	3.2	3.2	3.1
Glass containers	4.8	3.8	4.2
Plastic bottles	4.0	3.8	3.2
Plastic film	3.7	3.8	3.6
Laminates	4.4	4.3	3.9
Corrugated containers	3.4	3.2	2.9
Multiwall bags	4.5	3.8	3.7
Kraft paper	3.5	3.4	2.5
Folding cartons	4.2	3.7	4.0
Fiber drums	3.3	3.2	2.9
Industrial crates	3.6	3.2	3.2
Strapping	3.2	3.2	2.7
Steel drums (shipping)	3.3	3.2	2.9
Pallets	2.6	2.5	2.6

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES ($/lb.)

	May '87	April '87	May '86
Aluminum can stock ($/lb.)	1.00	1.00	.95
LDPE/liner($/lb.)	.33	.31	.30
LDPE/clarity($/lb.)	.34	.34	.34
LLDPE/butene($/lb.)	.32	.30	.28
LLDPE/octene($/lb.)	.36	.36	.33
HDPE/blow molding($/lb.)	.34	.33	.32
HDPE/film grade($/lb.)	.36	.35	.35
Polystyrene/general purpose($/lb.)	.58	.46	.32
Polystyrene/impact($/lb.)	.55	.49	.34
PVC/general purpose($/lb.)	.33	.33	.31
PP/homopolymer($/lb.)	.38	.38	.34
PP/copolymer($/lb.)	.48	.48	.44
ABS($/lb.)	1.07	1.06	.98
Unbleached kraft/shipping sack($/ton)	460	460	400
Unbleached kraft/grocery sack($/ton)	400	400	330
Linerboard, 42 lb. east($/ton)	350	350	280
Linerboard, 42 lb., west($/ton)	350	350	285
Corrugated med., semichemical($/ton)	320	320	260
Recycled folding boxboard, clay coated($/ton)	400	400	375
Recycled folding boxbd., chipbd.($/ton)	310	310	290
Bleached kraft, folding carton($/ton)	630	630	565

Source: Purchasing, a Cahners publication

RAPID GROWTH SEEN FOR SINGLE-SERVE PACKAGING

Plastics expected to be a star performer

At present, according to a study by Business Communications Co., $11.1 billion worth of single-serve containers are used each year in the United States. By 1991, the study said, that figure will increase to $12.4 billion.

Reasons seen by the researchers for this rapid growth include the continuing proliferation of convenience food outlets, the increase in the senior citizen population, and lifestyle changes which will reduce the number of large meals prepared at home.

Use of plastics in this period is expected to nearly double within the single-serve packaging industry from 16 to 31 billion units. Plastic single-serve beverage and food containers will penetrate all segments of the industry, the study said. By the end of the century, their use will extend into retort canning of meat and fish dishes and into beer cans, two areas that have proved resistant so far to the penetration of plastics.

MORE STATS . . .

Industry shipments of **corrugated and solid-fibre products** for the first quarter of 1987 were 5.3 per cent higher than those for the first quarter of 1986, said the Fibre Box Association, Chicago. Consumption of containerboard for the first quarter of 1987 was 4.4 per cent higher than that of the same period last year . . . Shipments of **coil-coated steel and aluminum** in 1986 slipped 3 per cent from 1985, according to the National Coil Coaters Association, Philadelphia. Containers and packaging uses account for 3 per cent of the coil-coated steel market and 39 per cent of the coil-coated aluminum market . . . The number of **jobs in manufacturing** will grow steadily during the next 18 months, said economists for Cahners Publishing Co., Newton, Mass. Between now and the end of 1988, said Cahners, the number will increase from 19.2 million to 20.2 million.

SPECIAL REPORT

THE TOP 50 PACKAGING GIANTS

Which companies spent the most money on packaging materials and finished containers in 1986? PACKAGING ranked the top 50 firms—they're true Giants

By Melissa Larson Senior Editor

Which U.S. firms spent the most money on domestic packaging in 1986? We set out to find out, using several sources: U.S. Department of Commerce Census of Manufacturers data, industry supplier and trade association figures, 1986 sales figures for the Fortune 500, annual report data, and a big assist from our own Cahners Research Dept. We subtracted international operations, since we were interested only in domestic spending on packaging, but included the value of any self-manufactured containers. The result is our listing of the Top 50 Giants—companies whose combined purchases made up 18.4 per cent of the total $48.3 billion packaging industry last year.

Although our Giants belong to Fortune's 500, many of America's largest companies are missing—you'll find no mention of Exxon, AT&T, or General Dynamics. General Motors and IBM are there, but fairly far down the list. Rather, our Giants are the companies which package America's most famous and beloved consumer brand names: from Budweiser to Del Monte and from Ivory to Coke.

The packaging-intensive products which make a company a Giant are the things consumers eat, drink and use every day. Things like beer, cheese, ketchup, cigarettes, soft drinks, frozen pizza, yogurt, disposable razors, light bulbs, shampoo, cold remedies, and ice cream. Well-known brand names are precious selling tools, and our Giants use packaging to capitalize on them.

Take for example Anheuser-Busch, our No. 1 Giant. Like most of the firms on the list, they're diversified—with thriving bakery operations, snack foods, theme parks and even a major league baseball team. Yet the company's major marketing thrust remains its nine beer brands. Budweiser is the best-selling beer brand in the world, and the firm's financial commitment to quality packaging—which includes self-manufacture of aluminum cans—indicates its intention to keep Bud on top.

And we expect next year's Giants figures to be even higher. If it's true that 80 per cent of all purchasing decisions are made in the retail store, then in-store shelf impact may soon be more important to brand supremacy than radio and TV advertising—and marketers' packaging purchases will reflect this.

NATURAL! NO PRESERVATIVES
HAND COOKED
HAWAIIAN KETTLE
POTATO CHIPS
EAGLE
Dewey Stevens
BUD
ROMAN Light WHEAT BREAD

Bakery and snack packaging, as well as their famous beer bottles and cans, make Anheuser-Busch our No. 1 Packaging Giant.

SMOKED
Dark
NEW! Family Size
A & EAGLE
PRETZELS
Anheuser-Busch Companies
EAGLE
BUD LIGHT
TO OPEN TEAR HERE
LIGHT
BUD LIGHT
Budweiser
NET WT. 16 OZ. (1 LB.) 454 g
ROMAN

Rank	Company (location)	$ Spent on Packaging (thousands)
1	Anheuser-Busch (St. Louis, MO) **Major Brands:** Budweiser, Bud Light, Busch, Michelob, Natural Light, L.A., Carlsberg, Colonial bread, Earth Grains, Roman Meal Light, Eagle Snacks	$897,470.13
2	Philip-Morris (New York, NY) **Major Brands:** Miller beer, General Foods cereals, Jello, Maxwell House, Oscar Meyer, Entenmann's, Marlboro cigarettes	$806,700.77
3	Procter & Gamble (Cincinnati, OH) **Major Brands:** Tide, Bounce, Downy, Cheer, Joy, Ivory, Spic and Span, Mr. Clean, Comet, Jif, Crisco, Duncan Hines, Crush, Folger's, Charmin, Pampers, Oil of Olay, Zest, Lava, Sure, Secret, Vidal Sassoon, Pantene, Crest, Gleem, Scope, Nyquil, Vicks, Pepto-Bismol	$680,079.65
4	Pepsico (Purchase, NY) **Major Brands:** Pepsi, Mountain Dew, 7UP, Slice, Fritos, Cheetos, Doritos, Tostitos, Lays, Ruffles, O'Grady's	$574,768.00
5	RJR Nabisco (Winston-Salem, NC) **Major Brands:** Salem, More, Now, Camel, Nabisco, Del Monte, Patio, Ortega, Fleischmann's, Blue Bonnet, Inglenook wines, Beaulieu wines, Smirnoff, Black Velvet Canadian, Harvey's Bristol Cream	$568,593.00
6	Coca-Cola (Atlanta, GA) **Major Brands:** Coca-Cola, Tab, Sprite, Fanta, Minute Maid, Hi-C, Bacardi fruit mixers	$428,394.10
7	Kraft (Glenview, IL) **Major Brands:** Kraft, Velveeta, Philadephia cream cheese, Miracle Whip, Lender's bagels, Tombstone pizzas, Breakstone's, Breyer's, Sealtest, Frusen Gladje, Light 'n Lively, Duracell batteries	$381,859.31
8	Kimberly-Clark (Dallas, TX) **Major Brands:** Kleenex, Kotex, New Freedom, Huggies, Delsey, Depend	$325,428.42
9	Campbell Soup Co. (Camden, NJ) **Major Brands:** Campbell's, Swanson's, Vlasic, Pepperidge Farm, Godiva chocolates	$306,573.04

Domestic packaging expenses include value of self-manufactured containers

Rank	Company (location)	$ Spent on Packaging (thousands)
10	**Sara Lee Corp.** (Chicago, IL) **Major Brands:** Sara Lee, Jimmy Dean, Hillshire Farm, Chef Pierre, Popsicle, Fudgsicle, Creamsicle, Hanes, L'eggs, Isotoner, Coach bags	$303,642.36
11	**Borden, Inc.** (New York, NY) **Major Brands:** Borden, Eagle, Meadow Gold, Lite-Line, Creamettes, Cracker-Jack, ReaLemon, Wyler's, Elmer's glue, Krylon, Rain Dance	$253,375.89
12	**H.J. Heinz** (Pittsburgh, PA) **Major Brands:** Heinz, Star-Kist, Ore-Ida, Weight Watchers, 9-Lives	$218,143.89
13	**IC Industries** (Chicago, IL) **Major Brands:** Pepsi-Cola General Bottlers, Pet Inc: Progresso, B&M, Whitman's, Old El Paso, Pet-Ritz, Downy Flake	$179,605.63
14	**Conagra** (Omaha, NB) **Major Brands:** Armour, Banquet, Country Pride, Chun King, Morton's	$175,026.75
15	**G. Heileman** (LaCrosse, WI) **Major Brands:** Old Style, Special Export, Blatz, Colt 45, Champale, Barrel 'O Fun	$163,394.21
16	**Pillsbury** (Minneapolis, MN) **Major Brands:** Pillsbury, Totino's, Jeno's, Chef Saluto, Green Giant, French's potatoes, Haagen Dazs	$156,040.30
17	**Adolph Coors** (Golden, CO) **Major Brands:** Coors, Coors Light	$150,217.60
18	**Johnson & Johnson** (New Brunswick, NJ) **Major Brands:** Johnson's, Band-Aid, StayFree, Sure & Natural, ACT oral rinse, Ortho-Novum	$136,904.40
19	**American Home Products** (New York, NY) **Major Brands:** Advil, Anacin, Dristan, Riopan Plus, Denorex, Preparation H, Chef Boy-ar-dee, Mamma Leone's, Jiffy Pop, PAM, Woolite, Easy-Off, Black Flag	$131,474.67
20	**Lever Brothers** (New York, NY) **Major Brands:** All, Wisk, Snuggle, Sun Light, Surf, Final Touch, Aim, Closeup, Imperial, Dove, Caress, Mrs. Butterworth's	$130,783.07
21	**General Electric** (Fairfield, CT) **Major Brands:** General Electric, RCA	$119,053.19
22	**Brown-Forman** (Louisville, KY) **Major Brands:** California Cooler, Jack Daniels, Korbel champagne, Canadian Mist, Southern Comfort, Early Times, Bolla, Cella, Martell cognac, Lenox china and crystal, Art Carved rings, Hartmann luggage	$111,982.01
23	**Quaker Oats** (Chicago, IL) **Major Brands:** Quaker cereals, Aunt Jemima, Gatorade, Ken-L ration, Kibbles 'n Bits, Fisher-Price toys	$111,460.60
24	**Ralston-Purina** (St. Louis, MO) **Major Brands:** Purina Chow, Lucky Dog, Savor, Alley Cat, Pro Plan, Chex cereals, Ghostbusters, Nerds, Wonder bread, Beefsteak bread, Hostess snacks, Yodels, Ring Ding Jr., Devil Dogs, Eveready, Energizer batteries	$108,994.41
25	**Kellogg** (Battle Creek, MI) **Major Brands:** Kellogg's cereals, Eggo, Pop-Tarts, Mrs. Smith's, Salada, Whitney's yogurt	$105,494.55
26	**PPG Industries, Inc.** (Pittsburgh, PA) **Major Brands:** Pittsburgh paint	$104,445.72
27	**Bristol-Myers** (New York, NY) **Major Brands:** Nuprin, Bufferin, Excedrin, Datril, Comtrex, Ban, Vitalis, No Doz, Windex, Drano, Vanish, O-Cedar, Endust, Clairol, Sea Breeze, PreSun, Alpha Keri, Enfamil	$100,007.25
28	**American Brands** (New York, NY) **Major Brands:** Jim Beam, Lucky Strike, Pall Mall, Carlton, Sunshine-Hydrox, Titleist, Jergens, Swingline, Master padlocks	$92,710.08

Post
Fruit & Fibre
with DATES, RAISINS & WALNUTS
Post
Natural
RAISIN
BRAN
NO SUGAR COATING
SAVE $1.70
Post
raisin
grape-nuts
Oscar Mayer
Hard Salami
Oscar Mayer
Marlboro
Marlboro
Maxwell House
Decaffeinated
JELL-O
GELATIN POPS
FREE
Variety Pack
12
Entenmann's
FAMILY PACK
Genuine Draft
Miller
Genuine Draft

Rank	Company (location)	$ Spent on Packaging (thousands)
29	**General Mills** (Minneapolis, MN) **Major Brands:** Cheerios, Total, Wheaties, Lucky Charms, Betty Crocker, Gold Medal flour, Bisquick, Hamburger Helper, Pop Secret, Yoplait, Gorton's	$89,389.96
30	**Colgate-Palmolive** (New York, NY) **Major Brands:** Colgate, Palmolive, Ajax, Curity, Hill's pet products, Irish Spring	$87,381.52
31	**E.I. duPont de Nemours** (Wilmington, DE) **Major Brands:** Remington firearms	$86,762.40
32	**Chesebrough-Pond's** (Westport, CT) **Major Brands:** Vaseline, Prince Matchabelli, Aziza, Erno Laszlo, Ragu sauces, Q-tips, Cutex, Rave, Bass shoes, Prince sporting goods	$72,949.78
33	**CPC International** (Englewood Cliffs, NJ) **Major Brands:** Skippy, Mazola, Thomas', Knorr, Hellman's, Karo, Old London, Arnold bread, Best Foods, Argo corn starch	$72,043.10
34	**Westinghouse** (Pittsburgh, PA) **Major Brands:** Thermo King, Longines-Wittenauer watches, Royal Crown bottling	$70,119.39
35	**Dow Chemical** (Midland, MI) **Major Brands:** Cepacol, Saran Wrap, Handi-wrap, Ziploc, Fantastick, Spray 'n Wash, Yes	$57,396.00
36	**Pfizer Inc.** (New York, NY) **Major Brands:** Feldene, Procardia, Cefobid, Ben-Gay, Barbasol, Stetson fragrances	$52,540.38
37	**Eli Lilly** (Indianapolis, IN) **Major Brands:** Keflex, Nalfon, Ceclor, Rumensin, Monteban, Treflan, Elizabeth Arden cosmetics	$42,073.24
38	**General Motors** (Detroit, MI) **Major Brands:** G.M. parts	$40,097.34
39	**Merck & Co.** (Rahway, NJ) **Major Brands:** Vasotec, Primaxin, Noroxin, Pepcid, Ivermectin	$38,021.70

In addition to Miller beer and Marlboro cigarettes, the General Foods family of brands belong to No. 2 Giant, Philip Morris.

Brands consumers use every day make companies Packaging Giants

ULTRA Pampers
Pampers
Crisco
100 OFF
Tide
Spic Span
NEW!
Crest
Duncan Hines
Fudge Brownie
NEW
Joy
Lemon Fresh
Ivory
NEW Jif
Pepto-Bismol
NyQuil
Pantene

With perhaps more famous brands than any other company, No. 3 giant Procter & Gamble has recently added the Richardson-Vicks products.

MELISSA LARSON
Senior Editor

"Working on this project has given us an opportunity to see the 'big picture'—to find out where packaging fits within the larger framework of American business and industry."

PLEASE RATE THIS ARTICLE

How would you rate this article? To reply, circle the appropriate number on the reader service card:

Outstanding	472
Above Average	473
Average	474
Below Average	475

Rank	Company (location)	$ Spent on Packaging (thousands)
40	North American Phillips (New York, NY) **Major Brands:** Norelco, Magnavox, Sylvania, Schick, Genie	$37,049.46
41	Whirlpool (Benton Harbor, MI) **Major Brands:** Whirlpool, Kenmore, Kitchenaid, Mastercraft, St. Charles	$35,949.43
42	Eastman Kodak (Rochester, NY) **Major Brands:** Kodak	$34,652.00
43	Baxter-Travenol Laboratories (Deerfield, IL) **Major Brands:** Carpentier-Edwards, V. Mueller	$34,164.00
44	Abbott Labs (North Chicago, IL) **Major Brands:** Pulmocare, Abbokinase, Erythrocin, Tranxene, Selsun Blue, Murine, Tronolane, Faultless	$32,761.00
45	SmithKline Beckman (Philadelphia, PA) **Major Brands:** Tagamet, Contac, Ecotrin, Sine-Off, Allergan	$32,591.60
46	Goodyear Tire & Rubber (Akron, OH) **Major Brands:** Goodyear	$31,763.59
47	International Business Machines (Armonk, NY) **Major Brands:** I.B.M.	$30,750.00
48	Emerson Electric (St. Louis, MO) **Major Brands:** In-Sink-erator, Skil tools	$28,380.30
49	Squibb Corp. (Princeton, NJ) **Major Brands:** Capoten, Azactam, Charles-of-the-Ritz cosmetics (sold at end of 1986)	$25,309.88
50	Gillette Co. (Boston, MA) **Major Brands:** Gillette, Good News, Dry Idea, White Rain, Paper-Mate, Flair, Liquid Paper, Braun appliances	$24,869.32

Statistics Tell Interesting Story

THE Club
Smirnoff
SCREWDRIVER
Plus

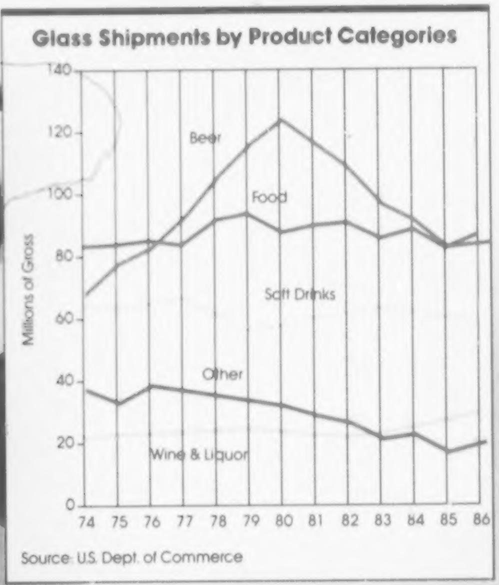
Glass really hasn't been hurt too much by plastic. The big culprit is aluminum.

When the beer industry switched from glass bottles to aluminum cans in the early 1980s, the results were devastating to glass containers. For five consecutive years (1980-85), billions of glass beer bottles were replaced by aluminum cans.

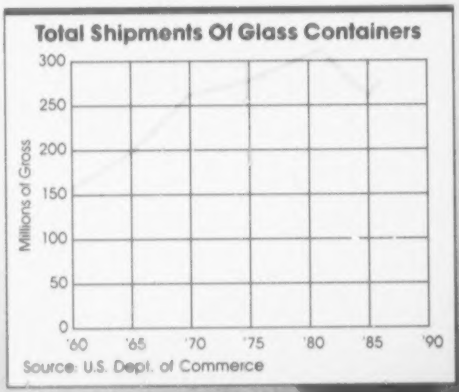
Meanwhile, in a variety of other markets, glass was losing ground to plastic containers. But the losses in those other markets were nothing compared to the losses suffered by glass in the beer market.

As shown in the graphs below, shipments of glass containers plummeted by 5.8 billion containers during the period 1980-85. The beer industry accounted for 5.0 billion of those losses. In other words, over 85 per cent of the total decline for glass containers was due to the brewers switching to aluminum cans.

However, most people be-


Glass Shipments by Product Categories

Source: U.S. Dept. of Commerce


Total Shipments Of Glass Containers

Source: U.S. Dept. of Commerce

Corona Extra
12 FL OZ
SELTZER
10 FL OZ

Beer, once the darling of the glass industry, has stumbled. But it could be staging a comeback.

In 1986, glass usage was up 5%, the first increase in the decade of the '80s

lieve the opposite is true—that plastics are responsible for the losses suffered by glass. This perception is caused, in part, by all the publicity given to plastic containers. Every time a new plastic container is tested, it generates headlines. Beer switching from bottles to cans doesn't get much attention.

Glass is up

But the real story for the moment is the rebound for glass containers. In 1986, total shipments of glass containers were up about 5 per cent, and so far in 1987 that trend is continuing.

The new applications described on the previous pages are largely responsible for that increase. Also, the losses suffered in the beer industry have bottomed-out. In fact, glass also appears to be on the rebound in the beer industry. In 1986, beer in glass bottles grew 4.1 per cent compared with 1.2 per cent growth for beer in cans. Overall growth in the beer industry was 2.1 per cent with imports growing at a faster rate than domestic beer.

Imports, however, may face tough times in the future because of the weak dollar. There's a limit to the price people will pay for imported beer, and some industry experts think we are approaching that limit.

Imported beer accounts for roughly 1.5 billion bottles per year. That's an attractive market for domestic brewers who might be tempted to introduce new brands in an effort to capture the prestige, image, and flavor of imported beers.

Most of the imported beers are packaged in glass bottles made by foreign companies. So any intrusion into this market by domestic brewers would be important new business for domestic glass companies.

Ideas for soft drinks

Another big market for glass bottles is soft drinks. However, soft drink aisles in supermarkets are dominated by cans and two-liter plastic bottles. But an interesting test is underway in Chicago that could see glass bottles returning to the aisles.

As with many successful ideas, the Chicago concept is quite simple. Basically, it involves 12-packs of 16-ounce nonrefillable bottles. One important aspect of this new approach is the corrugated case, which is open at the top so consumers can see the bottles. Also, the case has die-cut carrying handles on the sides, permitting it to be lifted and carried easily.

The critical aspect, however, is cost. The 12-pack of bottles is priced about the same as cans. So far the concept has met with outstanding success in Chicago. Virtually every major bottler in the city is using it.

Another idea receiving enthusiastic acceptance is "bottle bins." These are huge wire bins containing bottles of soft drinks, which shoppers purchase individually. The bins have two purposes: (1) They permit consumers to try new flavors and brands by purchasing individual bottles; and (2) They stimulate impulse purchases.

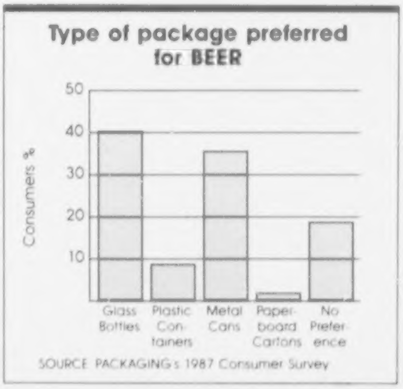
With so many new soft drinks on the market today, many people are hesitant to purchase six-packs or twleve-packs without first trying the product. Individual bottles in bins are proving to be a good way to permit "sampling."

At the same time, bottle bins increase sales. After shoppers make their normal

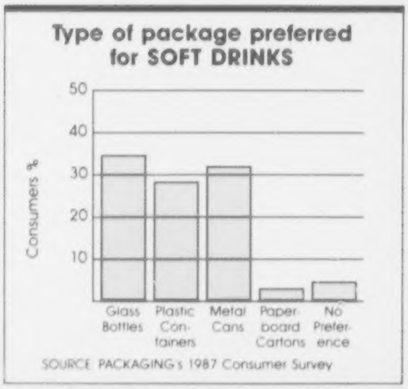
GLASS SHIPMENTS
(Thousands of Gross)

Type of Container	1986	1985	1984	1983	1982	1981	1980
Narrow Neck							
Food	27,737[P]	23,770	26,170	28,270	27,658	28,728	28,075
Medicinal and health supplies	15,907[P]	8,710	10,140	9,665	12,393	12,536	12,956
Chemical, household, and industrial		942	1,379	976	1,456	1,718	2,071
Toiletries and cosmetics		5,302	6,566	6,506	8,006	8,489	9,245
Beverage, refillable	62,093	1,553	2,100	3,383	3,729	4,138	4,571
Beverage, nonrefillable		58,532	59,475	59,234	57,291	56,110	53,277
Beer, refillable	87,601	1,870	3,473	2,475	1,899	1,570	1,869
Beer, nonrefillable		81,907	87,323	94,625	105,962	115,768	120,809
Liquor	10,873	11,939	14,015	14,712	13,757	15,365	15,790
Wine	17,157	14,036	10,414	8,916	8,408	8,638	8,784
TOTAL NARROW NECK	221,368	208,561	221,055	228,762	240,559	253,060	257,447
Wide Mouth							
Food	60,044	59,935	64,302	60,108	63,372	62,404	61,212
Medicinal and health	4,830[P]	2,715	3,150	2,995	3,097	3,274	3,084
Chemical, household, and industrial		1,015	988	812	1,159	1,122	1,191
Toiletries and cosmetics		595	455	426	659	820	965
TOTAL WIDE MOUTH	64,874	64,260	68,895	64,341	68,287	67,620	66,452
TOTAL (NARROW & WIDE MOUTH)	286,242	272,821	289,950	293,103	308,846	322,845	326,132

Source: U.S. Dept. of Commerce
P PACKAGING Estimates


Type of package preferred for BEER

SOURCE: PACKAGING's 1987 Consumer Survey


Type of package preferred for SOFT DRINKS

SOURCE: PACKAGING's 1987 Consumer Survey

INTRODUCING, THE NEW KID ON THE BLOCK WITH OVER 150 YEARS OF EXPERIENCE

Meet Ball-InCon Glass Packaging Corp., a brand-new producer of glass containers that hit the ground running on May 1, 1987, the day of its birth.

"How?" you say? Easy. Ball-InCon acquired the glass container assets of Ball Corporation and InCon Packaging, and with that, 150-plus years of combined experience in making glass containers.

No presents are requested for Ball-InCon's debut. Rather, Ball-InCon has something for *you*: 13 glass container manufacturing plants located coast to coast, a state-of-the-art glass container mould facility, flint, amber and green furnaces to meet your requirements and a commitment to providing the very best quality and service in the industry.

We're equipped and experienced in providing glass containers for food, wine, soft drinks, liquor, beer, cosmetics, pharmaceuticals and chemicals. We'll help you design a new container, or show you how one of ours can meet your needs.

Ball Glass Container Group has been a provider of quality glass food containers since 1882.

InCon Packaging has been producing quality food, beverage, liquor and wine containers since 1937.

You might have known us in the past as Ball, InCon Packaging, Laurens/Pierce or Northwestern. *Now* you can call us Ball-InCon.

Ball-InCon
Glass Packaging Corp.
P.O. Box 4200
Muncie, IN 47307-4200
(317) 741-7000

Ball-InCon

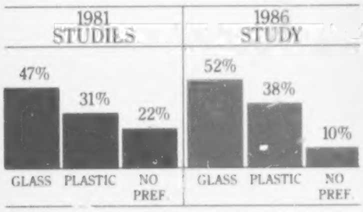
For information circle **65**

Consumer Preference Study: Colas in 16-oz. Glass & Plastic Bottles
16 oz.
GLASS
MAY 15, 1987

Research proves once again that consumers prefer soft drinks in glass.

There's one thing that can be said with certainty about America's soft drink consumers–they're consistent.

A broad based study conducted recently by Oxtoby-Smith, a leading independent research company, confirmed a clear-cut consumer preference for colas in 16-oz. glass bottles versus 16-oz. plastic bottles. This preference for glass over plastic is consistent with the average of two studies conducted five years ago.



Regardless of whether the beverage was served with or without ice, from bottles or cups, with a straw or without, *males and females in all age groups preferred drinking colas from glass bottles.* And the strongest preferences for glass as a package were among the "heaviest users" of colas.

THE NATURAL PACKAGE PEOPLE NATURALLY PREFER.

This recent study simply reinforces what we've known for decades: People prefer glass. And the reasons are perfectly clear.

Glass projects a quality image with consumers. It also lets people see the beverages they're buying—and they like that. What's more, glass protects flavor without affecting taste.

GLASS IS A HOT PACKAGE WITH BOTTLERS

"We are pleased with the success of our 16-oz. glass package here at Denver Pepsi. Single service 16-oz. has opened up several markets for us. Our customers like single service glass packaging."

—Larry Ayres
Senior Vice President
Pepsi-Cola Bottling Co. of Denver
Denver, CO

"NR glass is a hot package. Right now we're seeing consumer preference shifting from refillables to NR's. For the first time, supermarkets are promoting glass."

—James W. Bonebrake
VP Manufacturing
Kemmerer Bottling Group, Inc.
Joliet, IL

"Glass packaging has always been important to us. We have been very active with the 10- and 16-oz. single service glass packages. They showcase our product well."

—Donald R. Cameron
General Manager
Cameron Coca-Cola Bottling Co., Inc.
Pittsburgh, PA

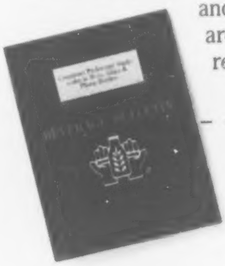
GLASS IS MORE RECYCLABLE THAN EVER.

Glass recycling programs have been established across America, and more people are finding that recycling pays.

A significantly higher percentage of new glass bottles are being made from old bottles—and consumers are showing a growing appreciation for 100% recyclable glass.

For information circle **66**

This message is brought to you by the men and women who make glass containers. Naturally.



DISCOVER THE GLASS PREFERENCE FOR YOURSELF.

For a FREE report of the consumer research findings, complete and return this coupon.

Glass Recycles

Name Title

Company

Address

City State Zip

Send to: Glass Packaging Institute, 1133 20th St. NW, Suite 321, Washington, D.C. 20036

© 1987 by Glass Packaging Institute

Wine coolers, selling more than 3 million bottles per day, have pumped new life into glass container operations

soft drink selections as part of their shopping routine, they tend to make impulse purchases from well-placed bottle bins. One variation of the bottle bin is the vertical merchandising rack. Either way the results are the same —increased sales.

Consumers prefer glass

When asked whether they preferred glass bottles, metal cans, plastic bottles, or paperboard cartons for soft drinks, consumers said glass bottles. That question was asked as part of PACKAGING's 1987 Consumer Survey.

Glass bottles for soft drinks were preferred by 34.3 per cent of the respondents; metal cans were preferred by 30.5 per cent; plastic containers by 28.0 per cent; paperboard cartons by 2.1 per cent; and 5.1 per cent of the respondents had no preference. The two largest groups of consumers preferring glass containers were young singles (44.7 per cent) and older singles (42.6 per cent).

The same pattern between bottles and cans was seen when PACKAGING asked consumers about their preferences for beer packages. The answers were: 39.9 per cent for glass bottles; 34.1 per cent for metal cans; 7.2 per cent for plastic containers; and 1.0 per cent for paperboard cartons. However, unlike the responses for soft drinks, a whopping 18.2 per cent said they have no preference when it comes to beer packaging.

Earlier this year, the Glass Packaging Institute (GPI) sponsored a study comparing consumer preference for cola in 16-ounce glass bottles vs. 16-ounce plastic bottles. GPI is the trade association for the glass container industry. The study was conducted by Oxtoby-Smith, Inc., a New York-based research firm.

Results of the study showed 52 per cent of the consumers preferred cola in glass bottles, compared with 38 per cent who preferred plastic bottles. The remaining 10 per cent were undecided.

In the study, a total of 693 consumers—291 teenagers and 402 adults—were interviewed in shopping malls in the Northeast, Southeast, Midwest, Southwest, Mountain states and West Coast. Only those consumers who said they drink at least three 8-ounce glasses of cola per week and who said they regularly drink Coca-Cola Classic, Diet Coke, Pepsi-Cola or Diet Pepsi participated in the study.

Each respondent sampled the brand of cola they drink regularly. They were given two unopened 16-ounce single service bottles of the brand—one glass, one plastic. They opened the bottles and sampled the product in whichever way they wished —directly from the bottle, or in a paper cup, with or without a straw, and with or without ice. The cola in both bottles, however, was sampled the same way. After both bottles were sampled, the consumers were asked which they preferred.

Dewey Stevens
Premium Light
WINE COOLER
California Cooler
PEACH
BARTLES & JAYMES
Premium
CALIFORNIA
BLUSH
CHABLIS
REAL WINE COOLER
FRANZIA

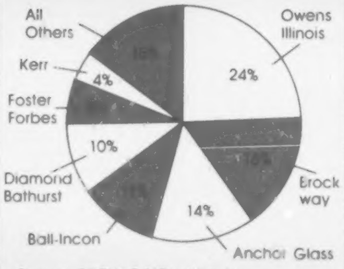
Wine coolers are positioned as a premium product and glass plays an important role in conveying that premium image. The phenomenal growth of wine coolers over the past few years is expected to level off. But the product has carved out a niche for itself and is predicted to be around for the long term. Wine coolers were a $1.7 billion market in 1986. Among the major companies marketing wine coolers are Gallo (Bartles & Jaymes), Seagram, Brown-Forman (California Cooler) and Sun Country. Each of those brands are planning to spend between $30 and $40 million for advertising this year. In addition, dozens of other companies are battling for market shares. The result will be an overwhelming amount of promotion.

Plants **Modernize,**

Capital Expenditures

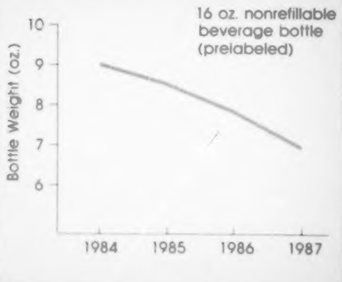
Anchor Glass: $40 million in 1986
Ball-Incon: $24 million in 1986
Brockway: $425 million since 1977
Diamond Bathurst: $40 million in 1986
Foster Forbes: $60 million over 5 years
Kerr: $25 million over past 3 years
Liberty Glass: $40 over past 5 years
Owens-Illinois: $80-90 million/year, avg.
Wheaton Glass: $10 million over 2 years

Estimated Market Share



Source: PACKAGING estimate

Advances in Lightweighting



Quality Improves

New molding machines make a big difference in producing stronger, lighter bottles.

An amazing transformation is taking place in glass container manufacturing, and new kinds of glass companies are emerging. These are the companies that survived the dramatic decline in usage of glass containers for five consecutive years (1980-1985).

Demand for glass containers plummeted 16% since 1980 and forced 31% of glass container production to shut down. As a result, companies underwent mergers, acquisitions, consolidations, leveraged buyouts, takeovers—and turmoil.

Industry consolidates

In 1980, twelve companies manufactured 70% of the glass containers used in the U.S. Today, five companies produce 75% of the containers.

The latest merger was between Ball Corporation and InCon Packaging. That move created a joint venture company, Ball-Incon Glass Packaging Corp., which in turn acquired the glass container businesses and assets of Ball Corp. and Incon Packaging. InCon itself was made up of Northwestern Glass, Laurens/Pierce Glass, Madera Glass, and the original, Indian Head Glass.

The joint venture, Ball-Incon, ranks as the leading producer of glass containers for the food industry and the fourth or fifth largest domestic supplier of glass containers. It has a 5,500-person work force and will have annual sales of $550 million.

Where the effort is

All glass container manufacturers, large and small, are investing millions of dollars in new equipment.

Much attention is being focused on forming, which is the heart of the glass operation. Here, considerable effort is being spent on obtaining uniform distribution of glass throughout the container. If glass is distributed more uniformly, the strength of the container is increased because weak spots (thin areas) are eliminated.

In addition, uniform distribution means less glass is needed to make the container. Thus, the container becomes lighter, and less costly. To top it off, production speeds are increased.

In particular, much work is taking place with "press and blow" technology for forming narrow-neck bottles. Rather than simply blowing the bottles, press-and-blow technology uses mechanical techniques to press the glass against the mold. This improves the distribution of glass within the bottles and increases production speeds. In addition to improved productivity, the result is stronger, lighter bottles.

Some companies, such as Owens-Illinois, have developed their own technology for press-and-blow molding. Also, Owens-Illinois has developed a first-of-its kind, "ten quad machine," which is said to be the fastest forming machine in the U.S. for glass containers. The machine has ten sections with four cavities per section. It operates at speeds well over 450 containers per minute.

Not to be outdone, American-National Can (Foster-Forbes) will install the USA's first 16-section machine later this year. The company also has two additional 16-section machines on order, and they are scheduled to be operational in early 1988. The 16-

Hundreds-of-millions of dollars are being pumped into glass plants

Computers control the glass furnaces, as well as many other operations, in today's modern glass container plants.

Finished bottles undergo a battery of on-line tests such as sidewall thickness inspection.

Seven companies produce 85% of the glass containers in the U.S.

section machine uses the press-and-blow technique developed by the Heye Glass Co. of West Germany, and the machine will produce in excess of 450 containers a minute. Foster-Forbes currently has 22 Heye lightweight bottle machines.

In one way or another, almost all glass companies are moving to press-and-blow technology, as well as to computerized control and electronic inspection of finished bottles.

In addition to investments in those areas, Brockway invests heavily in R&D for the actual molds. In fact, the company has its own metalurgical department which develops special mold alloys. On-going research with alloys is credited with giving Brockway an increase in productivity of 2 to 2-1/2 per cent per year since 1980.

Alloys are important because the temperature of molten glass is 2,300 degrees F. when it enters the mold. The trick is to turn this into a bottle and cool it quickly so that the bottle can support its own weight and be discharged from the mold. Obviously, the faster this can be done, the higher the productivity.

Huge investments

Over the past few years, huge sums of money have been invested to improve production of glass containers, and those investments are continuing. Owens-Illinois, for example, averages $80 to $90 million per year; Brockway spent $425 million since 1977, and so on.

Diamond Bathurst spent $40 million to improve its glass manufacturing equipment and facilities in 1986, and expects to spend another $40 million this year. During the past 15 months, the company rebuilt ten of its glass furnaces and renovated about 50% of its production capacity. This modernization program will continue for 1987.

Anchor Glass also spent $40 million in 1986 to improve its equipment and processes. The money was used to continue a program initiated in 1984 to replace smaller production machinery with larger, more efficient equipment. Also, the money was used to install sophisticated quality control equipment on all of the company's production lines.

Over the last 3 years, Kerr has invested in excess of $22 million for its four glass facilities. Capital improvements have been made throughout all manufacturing operations with substantial investments in computerized furnace control systems, high-productivity forming machines, and quality control equipment.

Ball-Incon spent $85 million over the past three years in its manufacturing operation.

Even the "small" companies are investing heavily. Wheaton Glass, for example, recently completed a $10 million investment in its glass-manufacturing operations for containers for the parenteral drug industry. Considerable sums have also been spent by Wheaton for improved equipment to produce glass containers for the cosmetics industry.

Liberty Glass, which has only one plant, spent $40 million over the past five years to make its plant "the most modern and best-equipped single-service beverage glass production plant in the world," according to the company.

The point is, *all* of the glass companies in business today are investing heavily in the future. PACKAGING's scorecard of investments by the companies is shown on the previous page.

WHERE THE GLASS PLANTS ARE

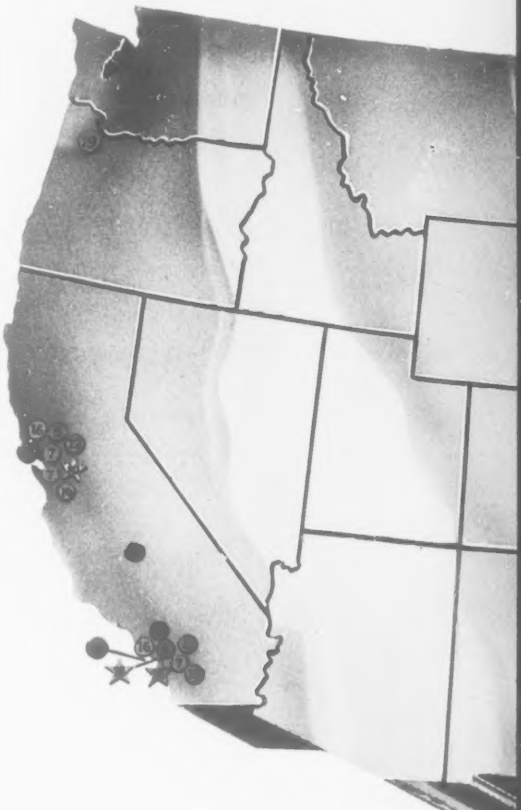
1 **Anchor Glass**
10 plants
Cliffwood, NJ
Connellsville, PA
Gurnee, IL
Henryetta, OK
Houston, TX
Jacksonville, FL
Salem, NJ
Shakoppe, MN
Warner Robins, GA
Winchester, IN
Headquarters
Tampa, FL

2 **Anchor Hocking (Carr-Lowrey)**
1 plant
Baltimore, MD
Headquarters
Lancaster, OH

3 **Arkansas Glass Container Corp.**
1 plant
Jonesboro, AR
Headquarters
Jonesboro, AR

4 **Ball-Incon**
13 plants
Ashville, NC
Carteret, NJ
Dolton, IL
El Monte, CA
Henderson, NC
Laurens, SC
Lincoln, IL
Madera, CA
Okmulgee, OK
Port Allegany, PA
Ruston, LA
Seattle, WA
Washington, PA
Headquarters
Muncie, IN

5 **Brockway, Inc.**
11 plants
Ada, OK
Brockway, PA
Crenshaw, PA
Danville, VA
Freehold, NJ
Lapel, IN
Montgomery, AL
Muskogee, OK
Oakland, CA
Pomona, CA
Zanesville, OH
Headquarters
Jacksonville, FL



6 **Central New York Bottling Co.**
1 plant
Auburn, NY
Headquarters
Auburn, NY

7 **Diamond-Bathurst, Inc.**
13 plants
Antioch, CA
Altanta, GA
Chattanooga, TN
Corsicana, TX
Dayville, CT
Elmira, NY
Gulfport, MS
Hayward, CA
Keyser, WV
Lawrenceburg, IN
Royersford, PA
Streator, IL
Vernon, CA
Headquarters
Malvern, PA

8 **Columbine Glass (Coors)**
1 plant
Wheat Ridge, CO
Headquarters
Wheat Ridge, CO

9 **Foster-Forbes Glass Co. (American-National Can)**
8 plants
Burlington, WI
Marion, IN
Maywood, CA
Milford, MA
Millville, NJ
Pevely, MO
Waxahachie, TX
Wilson, NC
Headquarters
Marion, IN

10 **Gallo Glass**
1 plant
Modesto, CA
Headquarters
Modesto, CA

11 **Glenshaw Glass Co., Inc.**
1 plant
Glenshaw, PA
Headquarters
Glenshaw, PA

12 **Hillsboro Glass Co.**
1 plant
Hillsboro, IL
Headquarters
Hillsboro, IL

14 **Industrial Glass Co., Inc. (Tropicana)**
1 plant
Bradenton, FL
Headquarters
Bradenton, FL

15 **Kerr Glass Manufacturing Corp.**
4 plants
Dunkirk, IN
Plainfield, IL
Sand Springs, OK
Santa Ana, CA
Headquarters
Los Angeles, CA

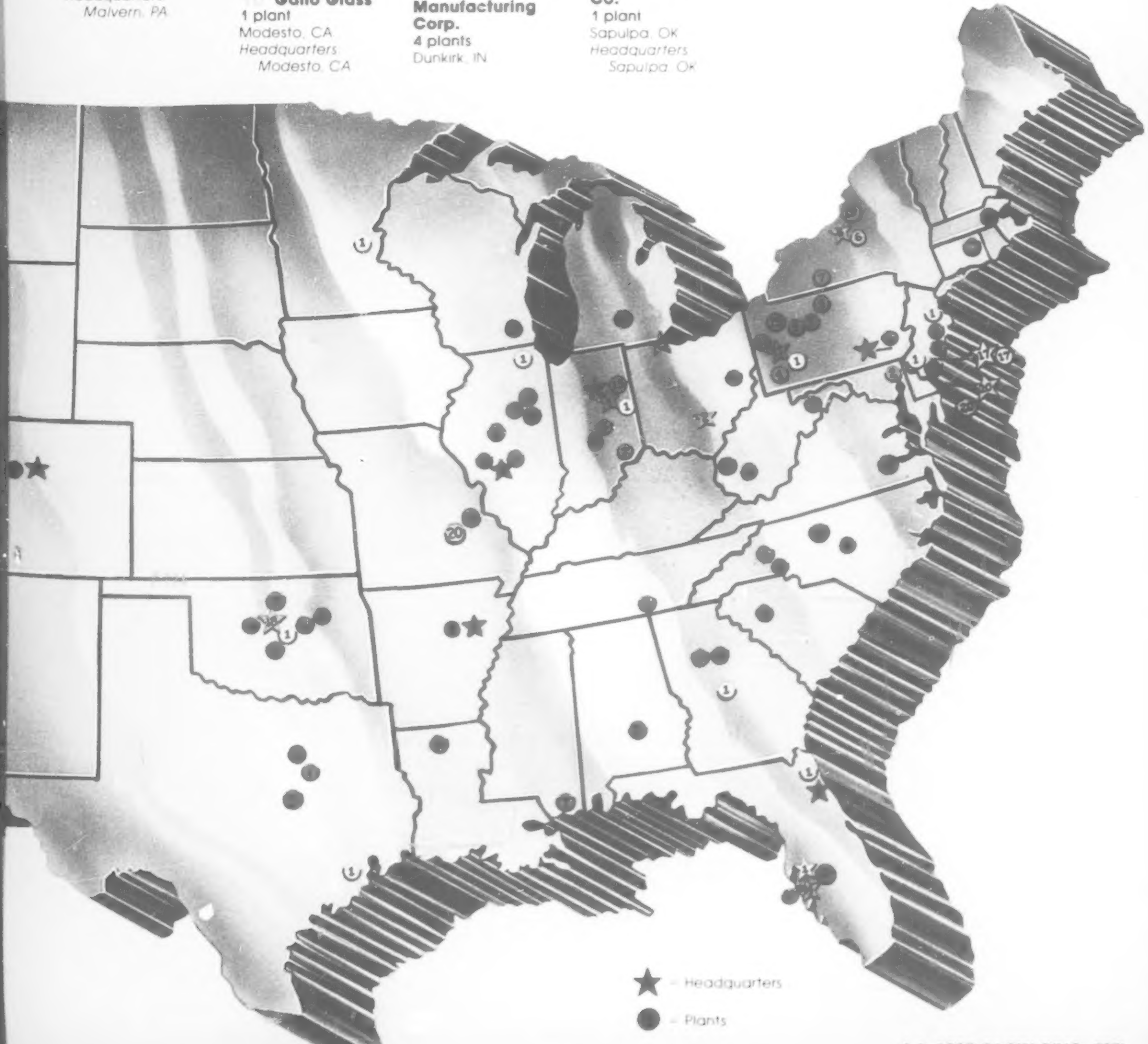
16 **Latchford Glass**
2 plants
Huntington Park, CA
San Leandro, CA
Headquarters
Los Angeles, CA

17 **Leone Industries**
1 plant
Bridgeton, NJ
Headquarters
Bridgeton, NJ

18 **Liberty Glass Co.**
1 plant
Sapulpa, OK
Headquarters
Sapulpa, OK

19 **Owens-Illinois**
14 plants
Atlanta, GA
Charlotte, MI
Clarion, PA
Huntington, WV
Lakeland, FL
Los Angeles, CA
Oakland, CA
Portland, OR
Streator, IL
Toano, VA
Tracy, CA
Volney (Fulton), NY
Waco, TX
Winston-Salem, NC
Headquarters
Toledo, OH

20 **Wheaton Industries**
2 plants
Flat River, MO
Millville, NJ
Headquarters
Millville, NJ



CALIFORNIA'S NEW RECYCLING LAW

September 1, 1987
Sales reporting begins. All containers marked 1 cent.

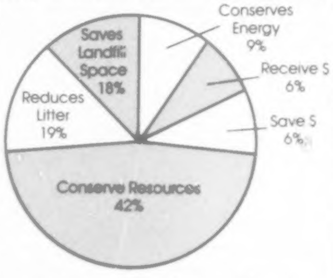
October 1, 1987
Recycler collection reporting begins. First report due January 9, 1988; every 6 months thereafter.

November 1, 1988
Report on recycling progress and fund. New containers to be covered.

June 30, 1989
Fee increases to 2 cents per container for types of containers failing to achieve 65% redemption rate. Effective December 31, 1989.

June 30, 1992
Fee increases to 3 cents per container for types of containers failing to achieve 65% redemption. Effective December 31, 1992.

Why Consumers Like Recycling



Source: Carolinas Glass Recycling. Based on telephone survey of 1,399 households in North and South Carolina.

GLASS AVAILABLE FOR RECYCLING

How much glass is available for recycling in any given city? Here is an approximate guide, adapted from a newsletter of the Pennsylvania Glass Recycling Corp., and The Nickel Solution News.

% of Glass Recovered	ANNUAL GLASS RECOVERY (TONS)						
100%	50	250	500	1,250	2,500	5,000	25,000
90%	**45**	**225**	**450**	**1,125**	**2,250**	**4,500**	**22,500**
80%	40	200	400	1,000	2,000	4,000	20,000
70%	**35**	**175**	**350**	**875**	**1,750**	**3,500**	**17,500**
60%	30	150	300	750	1,500	3,000	15,000
50%	**25**	**125**	**250**	**625**	**1,250**	**2,500**	**12,[illegible]**
40%	20	100	200	500	1,000	2,000	10,000
30%	**15**	**75**	**150**	**375**	**750**	**1,500**	**7,500**
20%	10	50	100	250	500	1,000	5,000
10%	**5**	**25**	**50**	**125**	**250**	**500**	**2,500**
5%	2.5	12.5	25	62.5	125	250	1,250
	1,000	5,000	10,000	25,000	50,000	100,000	500,000
	POPULATION						

Glass can be recycled into new bottles over and over again.

Recycling: Big Issue for Future

Glass is an interesting product in that it is 100 per cent recyclable; it can be used over and over to make new glass containers. Accordingly, glass container manufacturers purchase used bottles, crush them into cullet and mix the cullet with sand, soda ash, and limestone to produce new bottles.

Currently, glass plants use about 20 to 30 per cent cullet in their operations. But they'd like to use much more. Recycled glass helps lower the cost of manufacturing new containers, in addition to helping solve the solid waste problem. Furthermore, glass recycling gives glass manufacturers a competitive edge over plastic. This could become especially critical in the future as new laws take hold.

New California law

One of the important new recycling laws passed recently is California's "Assembly Bill 2020," which penalizes containers failing to achieve a 65 per cent redemption rate in California.

Specifically, the new law requires a minimum redemption value of one cent on every glass, aluminum and plastic container for soft drinks, beer and other "covered" beverages sold in California after September 1, 1987. This redemption value increases to two cents for containers failing to achieve a 65 per cent redemption rate by December 31, 1989. Then it increases to three cents for those containers failing to achieve the 65 per cent redemption rate by December 31, 1992.

Beverage distributors pay the redemption value which is placed into a special fund administered by the California Department of Conservation. The money collected is used to help develop recycling.

NJ passes law

In April, New Jersey Governor Kean signed a bill to make recycling a basic and permanent element of the state's solid waste management strategy. Basically, the bill mandates source separation of at least three recyclable items from materials that include glass, plastic, aluminum, and newspaper.

The New Jersey law is significant because it addresses all recyclables—not just beverage containers. The first year the program is enacted, municipalities are expected to reduce the previous year's total municipal solid waste by 15 per cent. The second year, the percentage increases to 25 per cent.

Each municipality must adopt an ordinance mandating that all residents, business and institutions source separate the specified materials for collection and recycling. However, ordinances will not be passed until markets have been developed for the recycled materials.

New laws in California and New Jersey could have tremendous impact

Igloos are an attractive and convenient way to encourage glass recycling. Premiering in California, the igloos are designed for use in high traffic areas such as shopping centers. They are used in tandem, one for clear glass and one for colored.

C1850-1
8/13/87

PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/AUGUST 1987

Here Comes The Pump...Again

Guide to WestPack '87

Corrugated Goes High Tech

Food Firms Battle Tampering

Drug Co. Installs New Line

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GEL
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With Solar Guard 15™
Sunscreen Protection
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A CAHNERS PUBLICATION
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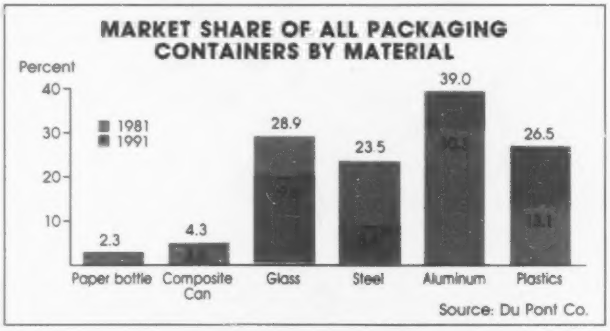
MARKET STUDY RANKS MATERIALS 1981-91

Steel containers seen taking biggest loss

New projections from Interpack '87, West Germany, showed continuing big changes in the market shares of packaging materials through the start of the 1990s. The analysis of U.S. packaging trends compared the share of market of all containers by material for 1981 and for 1991.

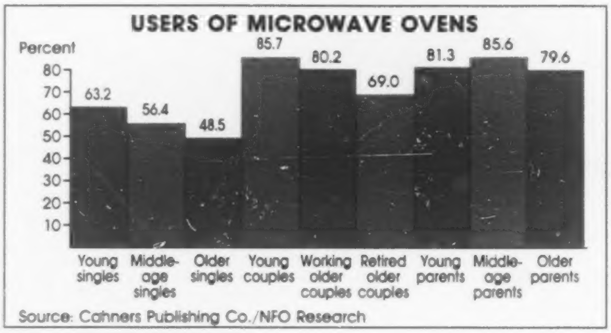
According to the study, share of market for steel will drop by nearly two-thirds during the 10-year period. Market share for glass will fall while aluminum's share will increase moderately and plastic's will increase sharply.



Source: Du Pont Co.

MICROWAVE USE HIGHEST AMONG PARENTS

Singles show lowest percentage of use



Source: Cahners Publishing Co./NFO Research

Of all consumers who responded to a recent PACKAGING magazine survey, parents as a group represented the highest percentage of microwave oven users. Couples without children reported the second-highest percentage of microwave use.

Less than half of the older singles who responded said they were microwave oven users—the lowest rate. Below-average per centages were reported also by young singles, middle-age singles, and retired older couples.

The highest percentage of users in any subgroup—85.7—was among young couples. Only one-tenth of a percentage point behind them were middle-age parents.

PACKAGING, in conjunction with NFO Research, Inc., sent questionnaires to 1,000 consumer households across the United States.

SHIPMENTS OF FOLDING CARTONS SET RECORD

Dollar volume rises almost $10 million

Folding carton shipments in April 1987 reached $300.5 million—nearly $10 million ahead of April 1986 and a new April record for industry billings.

The Paperboard Packaging Council, Washington, D.C., said that the cumulative dollar volume of carton shipments for the first four months of 1987 totaled nearly $1.2 billion—an increase of 2.6 per cent.

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION MAKERS SEPTEMBER 1987

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WestPack Show Planner

New Cushioning Fights Fire

Motor Oil Comes In Cartons

Re-Mi Foods Runs High-Speed Line

How To Apply New Technology

NEW!
PUMICE-POWERED!
Lava
LIQUID HAND CLEANER

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SQUEEZE BOTTLE SCORES HIGH IN CONVENIENCE

Lowest rating given to "value for the money"

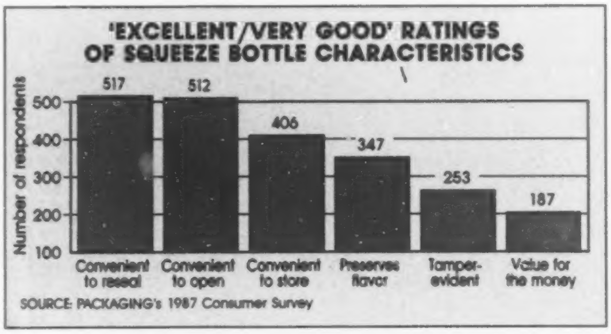
In a recent PACKAGING magazine survey, "excellent/very good" ratings of the food squeeze bottle varied significantly within six categories.

In terms of convenience of opening and resealing, the squeeze bottle was rated excellent or very good by more than 70 per cent of the 721 survey respondents—the highest percentage for any attribute.

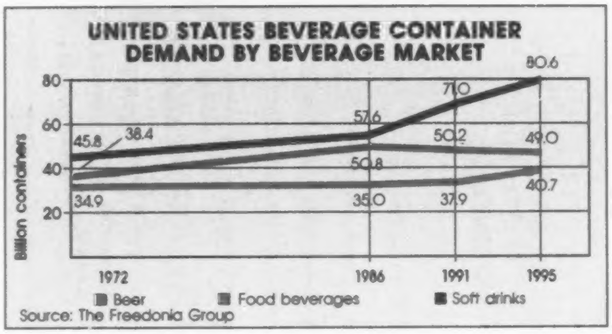
More than half of the total number of respondents gave the package highest marks in the "convenient to store" category. Fewer than half rated the squeeze bottle as highly for its ability to preserve flavor of the food product.

It was in the category "value for the money," however, that the squeeze bottle scored fewest "excellent/very good" ratings—just slightly more than 25 per cent.

The survey, conducted by PACKAGING in conjunction with NFO Research, Inc., was sent to 1,000 consumers.



SOURCE: PACKAGING's 1987 Consumer Survey



Source: The Freedonia Group

DEMAND FOR BEVERAGE CONTAINERS TO RISE

Soft drinks account for most of overall growth

United States demand for beverage containers will rise significantly through 1995, according to a recent study by the Freedonia Group, Cleveland.

Total demand for containers for the beverages studied is expected to increase from 143.4 billion units in 1986 to 170.3 billion in 1995. The beverages are food beverages—defined as milk, juice, coffee, tea, bottled water and other noncarbonated drinks —beer and soft drinks.

During that time, beer container demand will fall slightly and food beverage container demand will remain nearly flat. Demand for soft-drink containers will account for almost all the increase, rising from 57.6 billion units in 1986 to 80.6 billion units in 1995. The reasons for the sharp increase in soft drinks, according to the report, are the addition of fruit juices to these drinks and other marketing concepts that are generating increased interest among "baby boom" consumers.

The study said container growth will be held down because of maturing end-use markets, the general trend toward larger-volume containers, and the continued decline of glass containers. Growth will be strong in asceptic packaging and plastic containers. Unit shipments of metal cans are also expected to remain strong.

PACKAGING LEADTIMES
(in weeks)

	July '87	June '87	July '86
Metal cans	3.3	2.9	2.6
Composite cans	2.5	3.4	3.4
Glass containers	4.1	4.4	5.1
Plastic bottles	3.7	3.4	3.5
Plastic film	3.6	3.1	3.4
Laminates	4.3	4.4	4.6
Corrugated containers	2.7	3.2	3.0
Multiwall bags	3.8	4.2	3.5
Kraft paper	2.7	3.4	2.8
Folding cartons	3.6	4.7	3.5
Fiber drums	2.8	3.5	2.9
Industrial crates	2.6	3.2	2.9
Strapping	2.5	2.5	2.6
Steel drums (shipping)	2.8	2.5	2.9
Pallets	2.7	2.6	2.9

Source: Purchasing, a Cahners publication

TRANSACTION PRICES

	July '87	June '87	July '86
Aluminum can stock ($/lb.)	1.08	1.00	.97
LDPE/liner($/lb.)	.34	.33	.26
LDPE/clarity($/lb.)	.35	.34	.28
LLDPE/butene($/lb.)	.35	.32	.25
LLDPE/octene($/lb.)	.45	.42	.30
HDPE/blow molding($/lb.)	.36	.34	.29
HDPE/film grade($/lb.)	.36	.35	.34
Polystyrene/general purpose($/lb.)	.55	.54	.31
Polystyrene/impact($/lb.)	.58	.57	.33
PVC/general purpose($/lb.)	.35	.34	.29
PP/homopolymer($/lb.)	.43	.38	.33
PP/copolymer($/lb.)	.53	.48	.43
ABS($/lb.)	1.07	1.07	.98
Unbleached kraft/shipping sack($/ton)	460	460	400
Unbleached kraft/grocery sack($/ton)	400	400	340
Linerboard, 42 lb. east($/ton)	350	350	350
Linerboard, 42 lb., west($/ton)	350	350	320
Corrugated med., semichemical($/ton)	320	320	280
Recycled folding boxboard, clay coated($/ton)	430	430	375
Recycled folding boxbd., chipbd.($/ton)	340	340	290
Bleached kraft, folding carton($/ton)	630	630	590

Source: Purchasing, a Cahners publication

POLYPROPYLENE DEMAND EXPECTED TO BE STRONG

New technology leading to "exciting" packages

Global demand for polypropylene is seen growing at an average annual rate of 5.5 per cent through 1990 by SRI International, Menlo Park, Calif.

A new study by the nonprofit think tank noted that recent advances in both resins and fabrication technology have placed polypropylene on the brink of exciting new packaging applications.

Sarah Soder, SRI senior consultant and author of the study, said, "The polypropylene business should provide excellent opportunities for entirely new areas of product development, as well as numerous areas for improved resin performances within existing markets."

She added, "As creative new ways of dispensing products are developed, well-established markets such as injection-molded caps and closures will expand. New uses of polypropylene in monolayered, laminated, and coextruded films will extend the traditional polypropylene film market."

MORE STATS . . .

By 1991, **co-extruded films** will have captured 25 per cent of the polyethylene film market and surpassed 2 billion pounds of resin consumption, said Phillip Townsend Associates, Houston, Texas. Between 1986 and 1991, the company's report said, consumption of polyethylene resins for film applications will rise from 7 to 8.5 billion pounds . . . **Consumer prices** are expected to rise 3.4 per cent in 1987 and an additional 4.1 per cent in 1988 according to Cahners Economics . . . Market share of **plastics in the United Kingdom** packaging industry stands at 25 per cent, according to the U.K. Institute of Packaging . . . The Society of the Plastics Industry, Washington, D.C., said that **U.S. production of plastic resins** in the first quarter of 1987 totaled more than 15.6 billion pounds, an increase of 8.7 per cent over the same period last year.

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PACKAGIN

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/OCTOBER 1987

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er Cuts
veaway 50%

w Line For
er Packs

Gatorade
NEW 64 OZ. SIZE
Gatorad
THIRST QUENCHE
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OTHER NATURAL FLAVORS • CONTAINS NO FRUIT JUICE

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PREFERENCES FOR BEER CONTAINERS VARY WIDELY
Glass rates highest among young singles and couples

A recent survey of consumers by PACKAGING magazine revealed wide differences in the container of preference for beer.

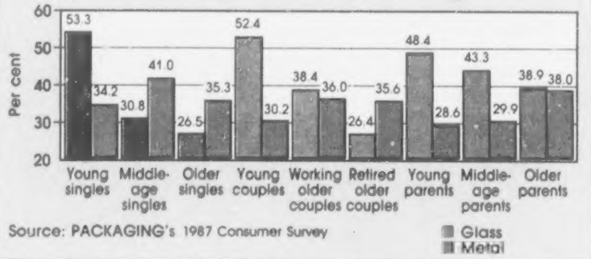
The survey, conducted in conjunction with NFO Research, Inc., obtained responses from 721 households throughout the United States.

When asked to state their preferences in beer containers, more than 50 per cent of the young singles and young couples chose glass. Neither glass nor metal rated higher in any group. The preference for glass dropped to its lowest level among older singles and retired older couples.

Preference for metal was highest among middle-age singles; lowest among young parents.

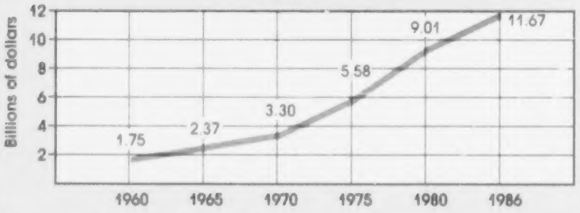
Overall, glass was preferred by 39.5 per cent of all respondents; metal by 34.1 per cent.

Plastic containers were chosen by only 7.2 per cent of all respondents.



TYPE OF CONTAINER PREFERRED FOR BEER

Source: PACKAGING's 1987 Consumer Survey



INDUSTRY VALUE OF SHIPMENTS CORRUGATED CASES

Source: The Fibre Box Association

PACKAGING LEADTIMES (in weeks)

	Aug '87	July '87	July '86
Metal cans	2.9	3.3	2.9
Composite cans	2.7	2.5	3.2
Glass containers	3.4	4.1	4.7
Plastic bottles	2.8	3.7	3.6
Plastic film	3.2	3.6	3.8
Laminates	3.8	4.3	5.4
Corrugated containers	2.8	2.7	3.1
Multiwall bags	3.4	3.8	3.5
Kraft paper	3.0	2.7	3.1
Folding cartons	3.8	3.6	3.5
Fiber drums	2.5	2.8	3.1
Industrial crates	2.6	2.6	2.8
Strapping	2.5	2.5	2.6
Steel drums (shipping)	2.6	2.8	3.1
Pallets	2.5	2.7	2.6

Source: Purchasing, a Cahners publication

TRANSACTION PRICES

	Aug '87	July '87	Aug '86
Aluminum can stock ($/lb.)	1.08	1.08	1.03
LDPE/liner($/lb.)	.34	.34	.34
LDPE/clarity($/lb.)	.35	.35	.26
LLDPE/butene($/lb.)	.35	.35	.26
LLDPE/octene($/lb.)	.45	.45	.29
HDPE/blow molding($/lb.)	.36	.36	.29
HDPE/film grade($/lb.)	.37	.36	.29
Polystyrene/general purpose($/lb.)	.52	.55	.33
Polystyrene/impact($/lb.)	.55	.58	.35
PVC/general purpose($/lb.)	.35	.35	.29
PP/homopolymer($/lb.)	.43	.43	.33
PP/copolymer($/lb.)	.56	.53	.43
ABS($/lb.)	1.07	1.07	.98
Unbleached kraft/shipping sack($/ton)	460	460	400
Unbleached kraft/grocery sack($/ton)	400	400	340
Linerboard, 42 lb. east($/ton)	380	350	320
Linerboard, 42 lb., west($/ton)	380	350	320
Corrugated med., semichemical($/ton)	350	320	290
Recycled folding boxboard, clay coated($/ton)	430	430	385
Recycled folding boxbd., chipbd.($/ton)	340	340	300
Bleached kraft, folding carton($/ton)	630	630	600

Source: Purchasing, a Cahners publication

VALUE OF SHIPMENTS OF CORRUGATED RISES
Latest figures show 1986 was record year

A new report from the Fibre Box Association, Chicago, reveals record-breaking numbers for the corrugated products industry.

The value of industry shipments of corrugated cases reached $11.67 billion in 1986, an increase of $260 million over 1985.

Annual shipments of finished corrugated and solid-fibre products totaled 283.9 billion square feet, an increase of 6.2 per cent over 1985 and 6.1 per cent over 1984.

Also in 1986, according to the report, the number of industry plants rose from 1,463 to 1,495.

FOODSERVICE INDUSTRY FORECAST REVISED
Strong economy prompts increase

A mid-year report on the foodservice industry shows the industry growing faster than expected.

At the beginning of 1987, the Cahners Publishing magazine *Restaurants & Institutions* projected real growth of the foodservice industry at 1.6 per cent. Since then, R&I has raised its projection to 2.2 per cent.

One reason cited by the magazine is the GNP's first-quarter rise of 4.4 per cent and second-quarter increase of 2.6 per cent—much stronger than the 1986 rate of 2.5 per cent.

PACKAGING ADHESIVES TO GROW THROUGH 1996
Co-extrusion tie-coat materials to lead field

According to a new report from Business Communications Co., Norwalk, Conn., the total market for packaging adhesives is expected to grow at a 2.7 per cent average annual rate through 1996. During that period, consumption of hot-melt adhesives is expected to grow at an annual rate of 8.7 per cent. And co-extrusion tie-coat adhesives are seen growing extremely rapidly—by an average 33 per cent each year.

Starch-derived adhesives will remain the single largest adhesive product for packaging throughout the next decade, said the study, but the growth of these and other naturally derived adhesives will be slow: approximately 1.5 per cent.

Synthetic adhesives will continue to replace starch and animal glues between now and 1996, in part because the synthetics set faster and therefore allow higher machine speeds.

The study noted that sales of co-extrusion adhesive will increase during the next decade from $7 million to almost $30 million. Sales of hot-melt adhesive will reach $310 million by 1996.

MORE STATS . . .

The American Paper Institute, New York, reported that U.S. **exports of kraft linerboard** rose 20.5 per cent in 1986, to a total of nearly 2.2 million short tons. The weakening of the dollar and strong growth in demand worldwide are two reasons, said the institute . . . **Automation in manufacturing industries** is growing in popularity. A report from the research firm FIND/SVP, New York, predicted annual growth of 15 per cent in the factory automation market through 1990 . . . The Packaging Machinery Manufacturers Institute, Washington, D.C., reported that new **orders for packaging and packaging-related converting machinery** rose 10.5 per cent between June 1986 and June 1987.

SPECIAL REPORT

SURVEY REVEALS PLANS FOR '88

By Mark Spaulding
Associate Editor

PACKAGING asked food and beverage manufacturers about their current and planned consumption of almost 100 different packaging materials, containers and supplies. The 975 responses confirm the hot-growth areas we've been tracking in the past few years, including the specialized packaging concepts of aseptics, controlled-atmosphere and microwavable packaging.

Big gainers in the coming 12 months—categories of whose current users are expected to buy more—include multilayer plastic bottles, tamper-evident closures, PET jars, EVOH, aluminum cans, shrink-film for tray-packs, peelable lidding, shrinkable label-bands, in-molding labeling and flexible co-extruded materials.

Of course, not all materials will be increasing in usage. Among those expected to decline are aluminum-foil trays, aluminum foil, cellophane, corrugated drums, foil labels, glass bottles and jars, metal strapping and steel cans.

Containers

PACKAGING obtained data on 25 different types of containers ranging from aerosols and bag-in-box constructions to bottles, cans and trays. Plastic-based containers far and away lead other types of materials as expecting the most growth in 1988.

Leading this pack are multilayer plastic bottles and jars, 82.4 per cent of whose current users are planning increased consumption next year. These containers will see more use in packaging sauces, condiments, and salad dressings.

PET bottles and jars are being used by nearly 12 per cent of the packagers surveyed and that number will increase next year as 2.5 per

Use of PET jars, tamper-evident closures, plastic bottles and aluminum cans is expected to grow the most next year

TOP 10 FASTEST-GROWING PACKAGING MATERIALS
Will you be using more
of this type of material or container in 1988?

	Per cent of current users who said usage will increase in 1988
1. Multilayer plastic bottles and jars	82.4%
2. Tamper-evident closures	80.5
3. PET bottles and jars	77.7
4. EVOH	75.8
5. Aluminum cans	75.0
6. Shrink-film for tray-packing	74.0
7. Peelable lidding	73.9
8. Shrinkable-bands for labeling	73.3
9. In-mold labeling	71.4
10. Co-extruded flexible materials	70.0

More than 82 per cent of current buyers will use more multilayer plastic bottles in 1988

PROJECTED USAGE OF CONTAINERS IN 1988

Per cent of survey respondents

	Currently use material	New material will begin to use in 1988	In 1988 will use		
			More	Same	Less
Aerosols	11.7%	0.1%	24.2%	72.7%	3.1%
Bag-in-box (dry products)	19.9	1.4	60.7	37.7	1.6
Bag-in-box (liquids)	18.1	0.7	58.0	38.8	3.2
Bags, multiwall	22.7	0.5	47.5	47.5	5.0
Bags/Pouches, Pre-made	29.4	1.3	53.0	38.1	8.9
Bottles/Jars					
Glass	30.5	0.4	50.6	35.8	13.6
PET	11.6	2.5	77.7	18.2	4.1
Polyethylene	11.4	0.5	61.0	34.0	5.0
PVC	5.2	0.2	46.5	48.8	4.7
Polypropylene	4.7	0.4	47.5	50.0	2.5
Multilayer plastics	3.1	1.0	82.4	17.6	—
Cans					
Aluminum	12.0	0.8	75.0	21.4	3.6
Composite	8.8	0.5	53.3	37.6	9.1
Paperboard	4.6	0.5	52.3	38.6	9.1
Plastic	4.0	1.5	66.7	31.2	2.1
Steel	20.7	0.2	44.4	42.2	13.4
Cartons					
Gable-top	9.6	0.2	60.4	35.4	4.2
Paperboard	39.3	0.4	64.0	31.9	4.1
Cups/Tubs					
Plastic	22.4	1.5	63.3	33.8	2.9
Paperboard	6.5	0.2	60.4	33.9	5.7
Pails					
Metal	5.4	0.1	21.7	65.3	13.0
Plastic	25.0	0.5	50.5	45.4	4.1
Trays					
Aluminum foil	7.0	0.1	43.1	35.4	21.5
Plastic	13.7	1.3	68.3	29.3	2.4
Tubes, squeezable	2.0	0.2	45.0	55.0	—

PROJECTED USAGE OF FLEXIBLE MATERIALS IN 1988

Per cent of survey respondents

	Currently use material	New material will begin to use in 1988	In 1988 will use		
			More	Same	Less
Aluminum foil	14.4%	0.3%	43.0%	38.0%	19.0%
Cellophane	18.0	0.4	42.3	40.9	16.8
Co-extrusions	18.1	1.1	70.0	28.2	1.8
EVA	4.5	0.1	53.7	43.9	2.4
EVOH	2.8	0.8	75.8	21.2	3.0
Ionomer	1.3	—	40.0	60.0	—
Laminations	20.9	0.6	61.4	35.9	2.7
Metallized film	12.7	1.3	64.8	31.1	4.1
Nylon	3.4	0.1	53.3	46.7	—
Paper	18.6	0.3	43.5	50.9	5.6
Polyethylene	24.1	0.2	54.5	41.5	4.0
Polyethylene, linear low-density	12.0	0.2	65.4	32.7	1.9
Polyester	4.4	—	52.6	44.8	2.6
Polypropylene	16.0	0.4	65.4	30.9	3.7
PVC	5.5	0.5	58.5	33.9	7.6
PVDC	2.2	0.3	57.1	42.9	—
Shrink film (individual packages)	35.4	1.7	65.4	28.8	5.8
Stretch film (individual packages)	26.2	0.9	57.4	40.0	2.6

cent more respondents said they will begin to use these containers for their products. Nearly 78 per cent of the current buyers see greater usage by their companies next year.

In fact, the popularity of PET beverage bottles has helped spur new growth for this container in other food product areas. Witness McCormick & Co.'s recent decision to switch its entire line of spices under the McCormick and Schilling brands to PET jars. PACKAGING's survey shows a total of 116 users expecting the same or expanded use for this container.

Food packagers are also big on plastic trays and cans. Although less than 18 per cent of the readers queried are currently using these containers, their ranks will grow roughly 20 per cent next year, with about 65 per cent of the current buyers planning greater consumption.

Greater use of aluminum cans is predicted by 75 per cent of the buyers questioned, with 73 per cent of those companies using aluminum cans for beer and softdrinks. This is not unexpected. But more companies are using this container for products other than carbonated beverages. Almost 17 per cent of aluminum can users who predict greater growth are in the more innovative product areas for this package.

Metal cans, in general, for food and beverages will decline slightly over the next nine years, according to a study by Business Communications Co., Inc. The Norwalk, Conn.-based firm estimates that the metal can's share of food packaging will fall by 0.2 per cent or roughly 2 billion containers by 1996.

However, our survey shows a healthy percentage of steel-can users planning expanded growth; 86.6 per cent of the 187 packagers responding in this category see equal or greater steel-can purchases for 1988, with 13.4 per cent seeing cutbacks in their use.

Flexible materials

Eighteen categories of flexible materials were analyzed in PACKAGING's survey. Once again, the most innovative, up-to-date materials will see the greatest growth in 1988.

A common element in high-barrier plastic containers designed to block out oxygen is EVOH copolymer. This material, as a resin or film, is being used by only 2.8 per cent of the survey's respondents, but nearly 100 per cent of these companies report plans for increased consumption next year. Clearly, the extensive growth expected for multilayer, plastic bottles is reflected in similar growth for this integral part of these containers.

A second high-tech material, co-extrusions, will see growth by 70 per cent of the packagers now using it. Co-extruded films are being used to package a variety of products from meat to candy.

Running about evenly in terms of future growth are shrink-film for individual packages, low-density polyethylene, and metallized film. Approximately 65 per cent of current buyers expect to purchase more of these flexible materials in 1988. The number of companies using metallized film will grow by about 10 per cent with the overall uses for it and LDPE continuing to be roasted coffee, candy, butter, frozen vegetables, and metallized film-seals for other containers.

Companies using shrink-film for individual packages will grow by 5 per cent. Food products expected to see greater use of individually shrink-packed containers include candy, prepared meats, cookies, and six-packs of canned soft drinks.

Labels

Paper, pressure-sensitive and adhesive-applied-on-line continue to be the most popular types of labeling among today's food packagers. Sixty-four per cent of the respondents to PACKAGING's survey say they currently use paper labels, followed by 53.3 per cent using pressure-sensitive labels and 27.3 per cent using adhesive-applied-on-line labels.

The total indicates that many packagers are now using more than one type. None of these label types, however, are reported to show the kind of outstanding growth next year expected of shrinkable-band, in-mold and plastic labeling.

With 73.3 per cent of users planning greater consumption of shrinkable bands, this category appears to be growing the fastest. Expect to see more use of shrinkable-bands for labeling food products such as cheese, butter and chocolate.

In-mold labeling for food packaging is a method whose time has finally come. Using this process, the label is applied to a plastic container as it is being blow-molded. Currently, it is being used by only 3.2 per cent of readers queried, but fully 94 per cent of these packagers will use similar or expanded quantities of in-mold labeling in 1988 for beverages like wines and distilled liquors, and dairy products such as fluid milk, cheese and butter.

Several more packagers say they will join the ranks of companies using plastic labels next year. Together with almost 64 per cent of current users, the trend toward expanded use of plastic labels will continue.

Closures

PACKAGING's survey compiled data on 13 kinds of closures, both primary and secondary types. Those that are expected to see the greatest growth in 1988 include tamper-evident closures, peelable lidding, inner seals and easy-open can ends.

With 80.5 per cent of current users planning to buy more tamper-evident closures, this category leads the pack. The survey found 3.1 per cent more respondents planning to use T-E caps for the first time next year, bringing the number of packagers using this device to more than 22 per cent of the readers questioned.

Tamper-evident closures are being used in all but four of the 36 food categories we analyzed. Fluid milk, wine and distilled-liquor packagers see the greatest growth for T-E closures in their markets while chocolate, confectionery products and beer will see above-average growth in the use of tamper-evident caps.

Peelable lidding, although used by only 6 per cent of respondents, will be purchased in greater quantities by almost 74 per cent of current buyers. This type of closure will be adopted next year by 2 per cent more of the companies we surveyed.

More than 9 per cent of packagers queried say they will use inner seals as a type of closure for their food products in 1988, and 67.5 per cent of current buyers see even greater consumption next year. Inner seals continue to be an important primary closure for fluid milk, sauces and dressings, cooking oils and roasted coffee.

Easy-open can ends, either steel or aluminum, are expected to be used in greater quantities by 66.1 per cent of current buyers. The most popular uses for this closure remain beer and soft drinks, however, 3 per cent of the packagers say their companies will use similiar or greater amounts of easy-open can ends next year for packaging fruits, vegetables and seafood.

Metal closures and screwcaps continue to be the most prevalent, used by 32.2 and 20.7 per cent of respondents, respectively. However, both of these categories have the least number of new packagers adopting these kinds of closures in the coming year.

Case packing-shipping

Bulk boxes, corrugated cases, drums and pallets are among the case-packing and shipping materials studied in our survey. PACKAGING found high percentages of companies using wood pallets, corrugated bulk boxes and cases, and stretch-wrap for unit loads, and all these categories will see expanded use by roughly 57 per cent of current

PROJECTED USAGE OF LABELS IN 1988

Per cent of survey respondents

	Currently use material	New material will begin to use in 1988	In 1988 will use		
			More	Same	Less
Labels					
Foil	22.2%	0.9%	46.6%	39.7%	13.7%
Paper	64.5	0.5	54.6	39.6	5.8
Plastic	6.7	1.1	63.9	29.5	6.6
Pressure-sensitive	53.3	1.7	56.6	37.0	6.4
Adhesive applied on-line	27.3	0.5	55.8	39.0	5.2
In-mold	3.2	0.8	71.4	22.9	5.7
Heat transfer	5.1	0.3	44.4	46.7	8.9
Shrinkable bands	7.4	2.0	73.3	21.4	5.3

PROJECTED USAGE OF CLOSURES IN 1988

Per cent of survey respondents

	Currently use material	New material will begin to use in 1988	In 1988 will use		
			More	Same	Less
Metal closures	32.2%	0.1%	52.5%	35.8%	11.7%
Plastic closures	27.4	1.4	60.2	37.3	2.5
Screw caps	20.7	0.5	56.4	40.2	3.4
Vaccum lug caps	5.5	0.2	52.1	41.6	6.3
Shrinkable bands	10.1	1.3	65.3	29.4	5.3
Inner seals	8.2	1.0	67.5	28.9	3.6
Dispensing closures (Push-pull, flip-top, etc.	7.1	0.5	55.9	41.2	2.9
Dispensing closures (Shaker-type)	2.3	0.1	55.9	41.2	2.9
Easy-open cans	11.5	1.6	66.1	31.2	2.7
Peelable lidding	5.9	1.7	73.9	24.6	1.5
Plastic overcaps	12.7	0.9	57.9	36.8	5.3
Child-resistant	1.3	0.1	60.0	20.0	20.0
Tamper-evident closures	19.0	3.1	80.5	17.9	1.6

Microwavable packaging tops the list with 89 per cent planning increased consumption in the coming months

PROJECTED USAGE OF BULK PACKAGING IN 1988
Per cent of survey respondents

	Currently use material	New material will begin to use in 1988	In 1988 will use		
			More	Same	Less
Bulk Boxes					
Corrugated	55.7%	0.9%	61.1%	36.6%	2.3%
Metal	0.9	—	33.3	66.7	—
Plastic	4.5	0.3	68.4	23.7	7.9
Corrugated Cases					
Regular	62.0	0.5	63.8	34.2	2.0
High-strength	14.8	0.7	67.4	32.6	—
Partitioned	24.9	0.2	53.5	42.8	3.7
Preprinted linerboard	19.6	1.0	62.5	33.1	4.4
Drums					
Corrugated	10.3	0.1	36.7	48.9	14.4
Plastic	9.4	—	43.0	49.4	7.6
Metal	12.4	0.1	34.0	56.6	9.4
Pallets					
Plastic	12.4	0.7	51.8	41.9	6.3
Wood	72.6	0.2	50.8	43.1	6.1
Shrink-film, tray-packs	18.4	1.7	74.0	21.5	4.5
Slip sheets	38.6	0.5	53.9	41.6	4.5
Stretch-wrap, unit loads	55.7	0.7	64.5	34.4	1.1
Strapping					
Metal	12.6	0.2	42.3	44.2	13.5
Plastic	37.0	0.2	44.1	48.7	7.2
Tape					
Gummed	45.1	0.4	51.3	42.3	6.4
Pressure-sensitive	10.8	0.2	66.1	33.0	0.9

PROJECTED USAGE OF PACKAGING CONCEPTS IN 1988
Per cent of survey respondents

	Currently use material	New material will begin to use in 1988	In 1988 will use		
			More	Same	Less
Aseptic	7.5%	2.1%	76.2%	20.2%	3.6%
Blister	3.1	1.1	64.7	29.4	5.9
Controlled atmosphere	11.0	2.1	73.3	23.8	2.9
High-barrier	12.9	2.1	75.2	21.7	3.1
Microwavable	8.8	3.9	89.3	8.8	1.9
Multipacks	14.1	1.0	73.9	25.3	0.8
Plastic squeeze bottles	4.7	1.0	73.1	23.0	3.9
Retortable pouch	2.0	1.3	84.0	12.0	4.0
Reclosable bags	5.5	1.7	71.0	22.5	6.5
Single-serve	21.6	1.4	74.1	23.3	2.6
Skin packaging	1.7	0.6	79.0	15.7	5.3
Tamper-evident	19.5	3.2	83.5	14.4	2.1
Vacuum	16.7	0.6	62.8	33.9	3.3

buyers. Two products, however, stand out as having the greatest potential for expanded use by food packagers: shrink-film for tray packs and high-strength corrugated cases.

Food companies across-the-board are using shrink-film for tray packing. More than 20 per cent of the packagers say they will be using this material next year and 74 per cent of the current buyers are planning for additional use.

High-strength corrugated cases are being employed by food packagers in nearly every division of the survey. All 100 per cent of companies using this kind of super-strong corrugated say they see similar or greater consumption of this material for their case-packing needs next year.

Other case-packing and shipping products expected to see increased use in 1988 include preprinted-linerboard cases, pressure-sensitive sealing-tape, plastic pallets and slip sheets.

Packaging concepts

Some of the most innovative and startling developments in food packaging revolve around the specialized concepts that 10 years ago were only ideas in search of hard engineering. Of the nearly 100 categories the survey looked at, these concepts received the highest percentages for increased growth.

Microwavable packaging tops the list with more than 89 per cent of current buyers planning increased consumption in the coming months. They will be applying this concept to greater numbers of frozen foods, especially vegetables and fish.

Sales of these advanced materials for prepared foods will reach 2.2 billion units by 1991, according to a study by C.H. Kline & Co., Fairfield, N.J. Nearly 60 per cent of these sales will be for entrees and dinners, with many of the products using susceptors, or metallized film laminated to paper or plastic carriers, to provide localized heating or browning.

The greatest increase, in terms of sheer volume, remains tamper-evident packaging in general. Nearly 23 per cent of the packagers will use some type of T-E materials for their food products in 1988, with 83.5 per cent of current users planning for greater purchases. Tamper-evident packaging is being applied by companies in all categories of the survey, especially dairy foods, sauces and dressings, and beverages. These figures are consistent with the number of readers planning on increased consumption of T-E closures, inner seals, and shrinkable bands.

By 1991, $12.4 billion worth of single-serve containers will be used each year in the U.S., according to a study by Business Communications. This is a nearly 12 per cent increase in four years and reflects a similar increase in the number of our readers planning to use single-serve packaging for the first time in 1988. Twenty-three per cent of packagers responding say they'll be using this concept, with 74.1 per cent of current buyers using more single-serve packaging next year.

Less than 3 per cent of the respondents will be employing retortable pouch packaging next year. Overall, the market for these products is slated to grow to only $100 million by 1995, according to FIND/SVP, New York City.

Other packaging concepts expected to see above-average growth in the coming months include aseptics, skin-packaging, high-barrier packaging and multi-packs. ■

PLEASE RATE THIS ARTICLE
How would you rate this article? To reply, circle the appropriate number on the reader service card:

Outstanding	**472**
Above Average	**473**
Average	**474**
Below Average	**475**

MARK SPAULDING
Associate Editor

"It is important to note the rapid adoption of special packaging concepts by today's food processors. Tamper-evident and microwavable packaging are here to stay, while more exotic types such as aseptics and controlled-atmosphere packaging are gaining converts."

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